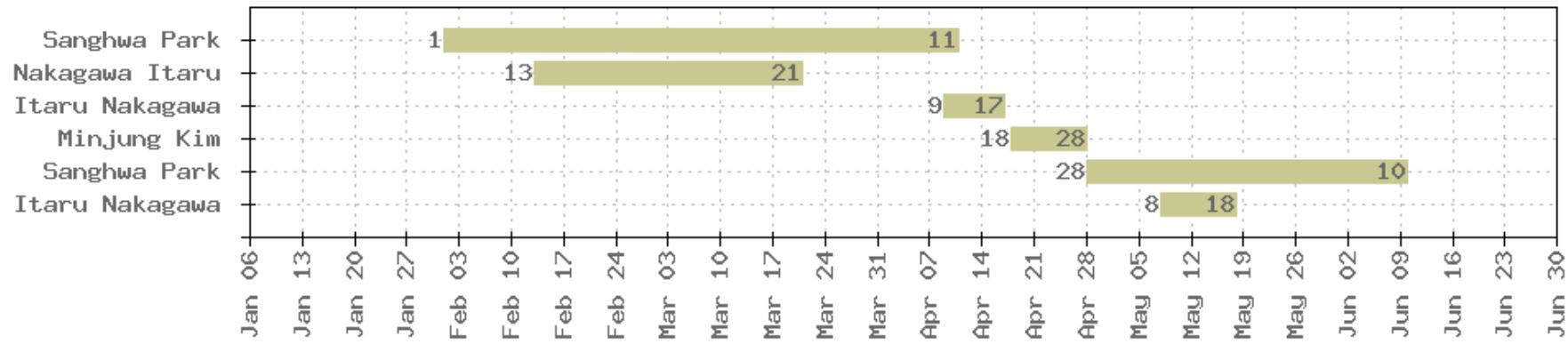


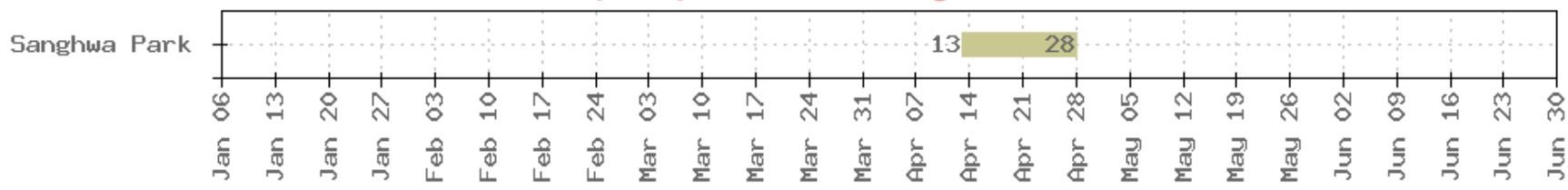
MuTr/MuTrig Performance of Run13

RIKEN/RBRC
Itaru Nakagawa

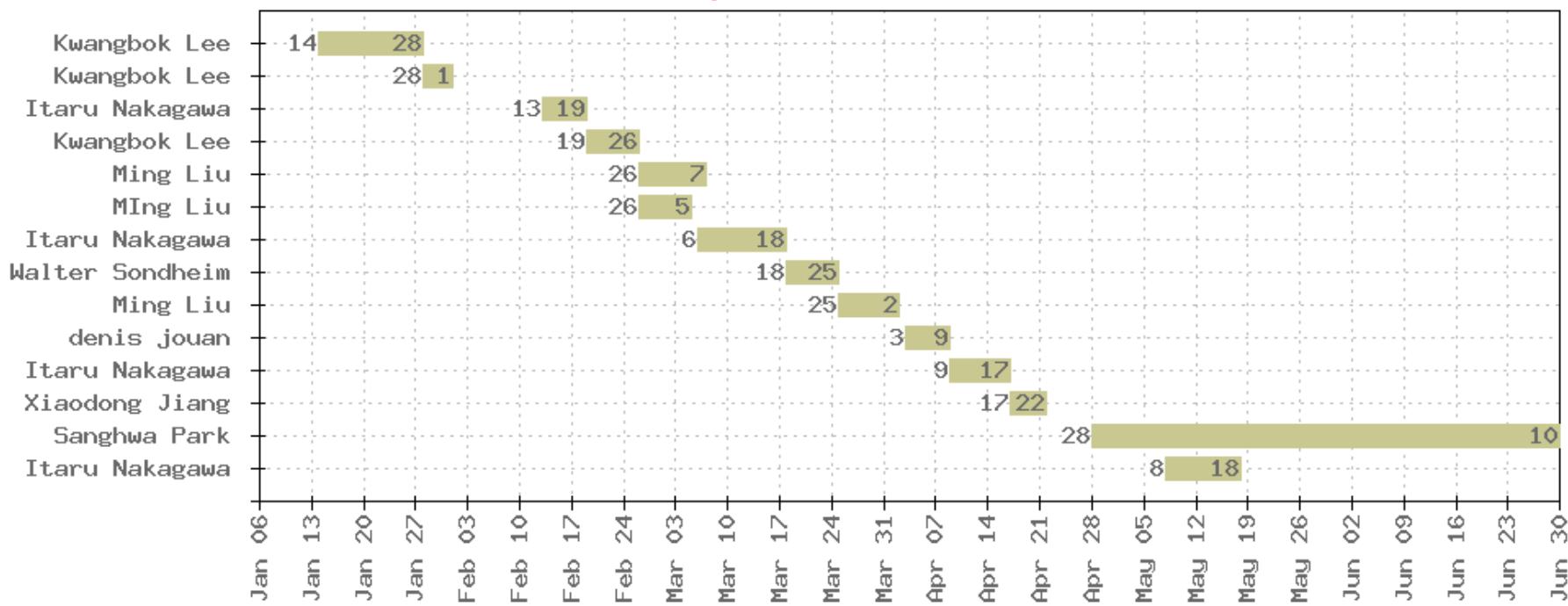
On-call Experts for MuTrg:



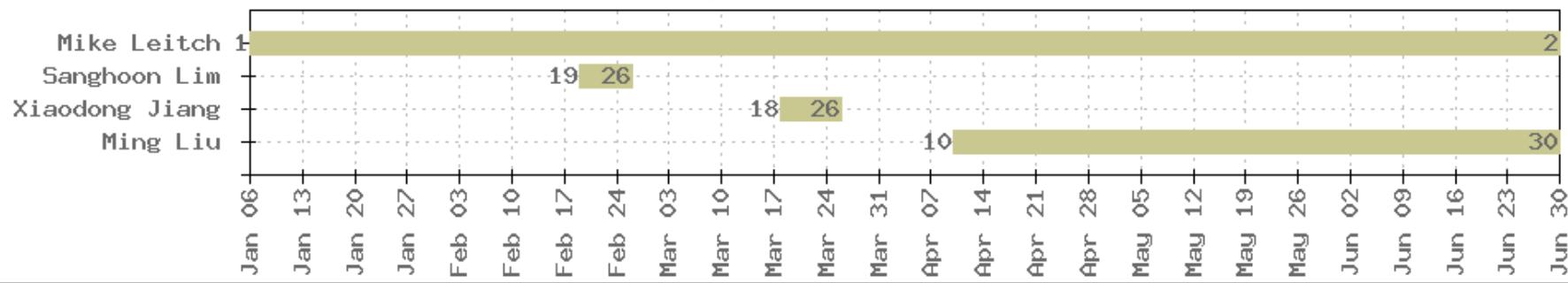
Backup Experts for MuTrg:



On-call Experts for MuTr:



Backup Experts for MuTr:



W TRIGGER REJECTION POWER

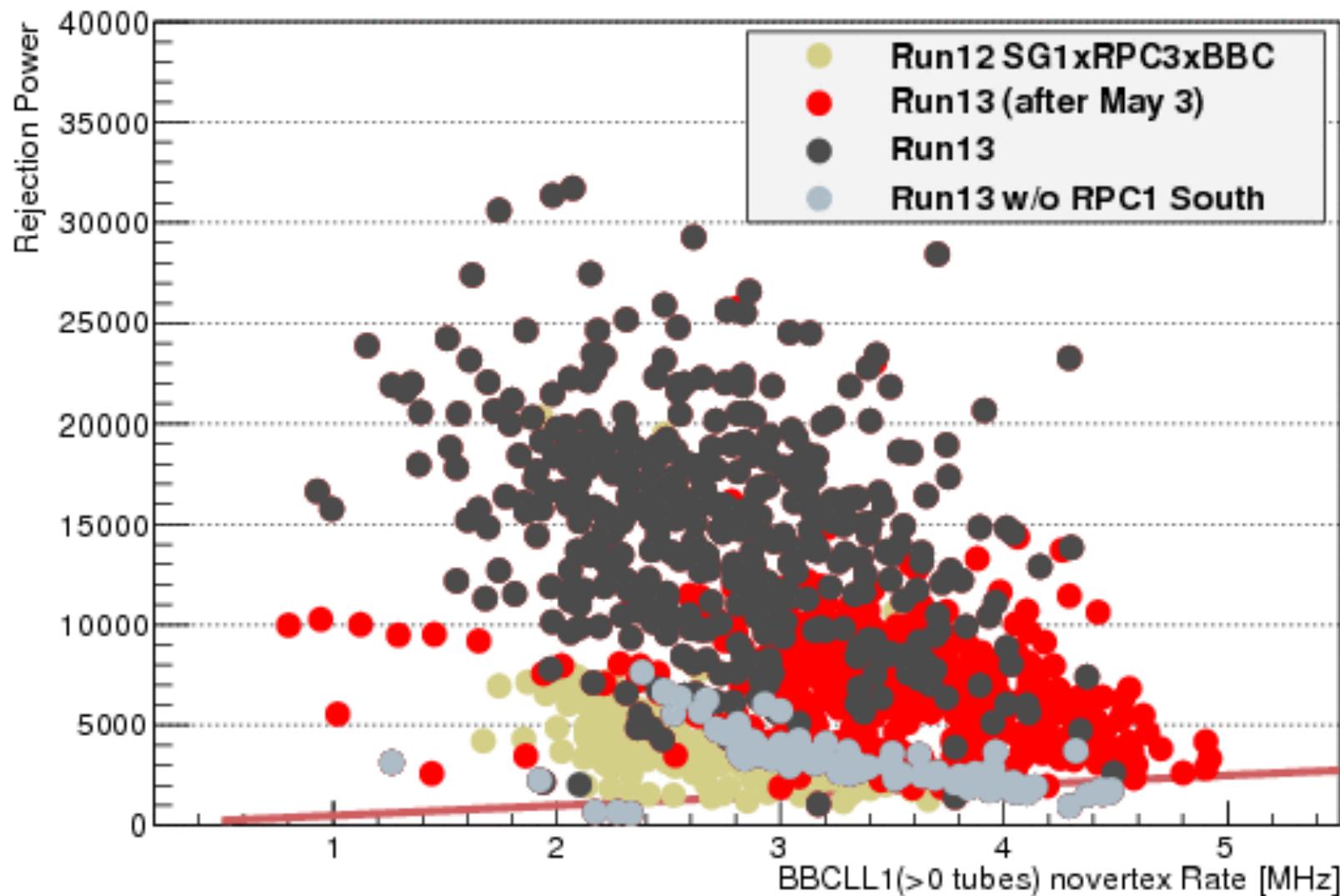
W trigger status

Period	
Mar 11 - April 27	Wrong RPC1 Mapping
April 27 – May 3	Removed RPC1 from Trigger
May 3 – End of Run13	RPC1 South Correct Mapping

- SG1_N||S×RPC1_N||S(C)×MUID_N||S1D
SG1_N×RPC3_N×RPC1_N(B||C)
SG1_N×RPC3_N(A)×MUID_N1D
- SG1_S×RPC3_S×RPC1_S(B||C)
SG1_S×RPC3_S(A)×MUID_S1D

Compare above trigger rates in three different periods.

North+South W-Trigger Rejection Power



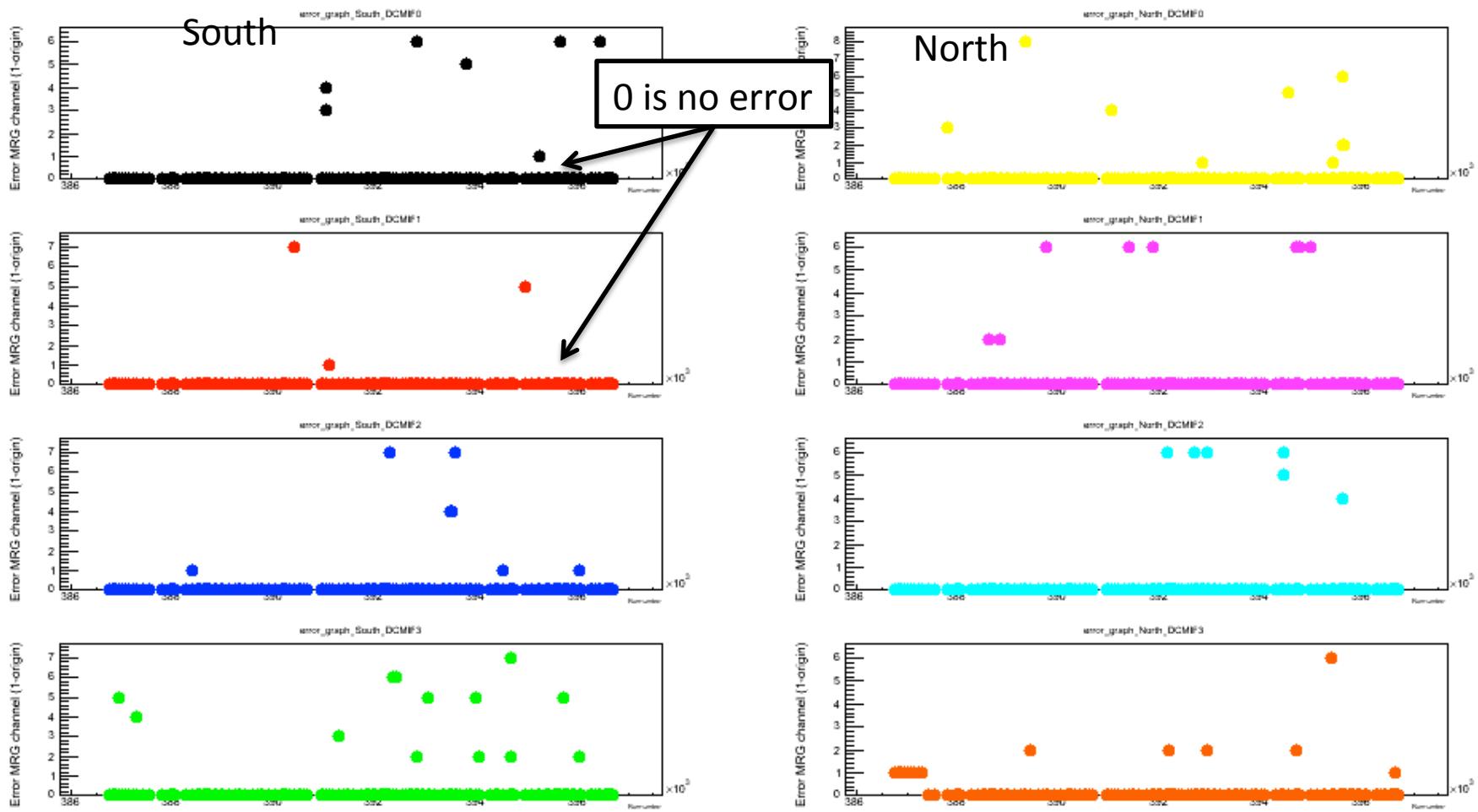
Rejection Power Summary

- W triggers were formed by 5 different trigger mixes with the combination of SG1, RPC1&3, MUID1D
- Rejection Power was sufficient to be <2kHz for the total of 5 triggers.
- Compared to Run12, rejection power is stronger due to MUID1D in the trigger mix. SG1 and RPC were operated loose condition.

STABILITY CHECK

ADTX/MRG Error History

MRG channel number which detected Error

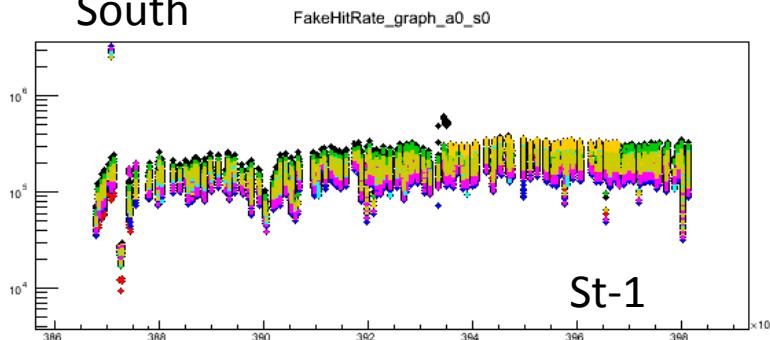


Occasional error, but not continuous. Most of errors are cured right after they first appear.

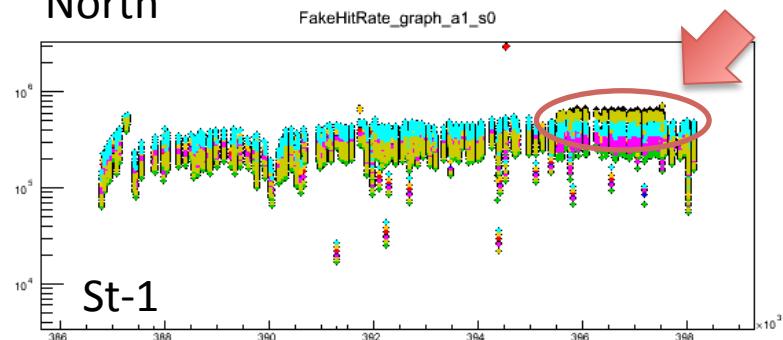
Fake Hit Rates History

Oct1: — Oct2: — Oct3: — Oct4: — Oct5: — Oct6: — Oct7: — Oct8: —

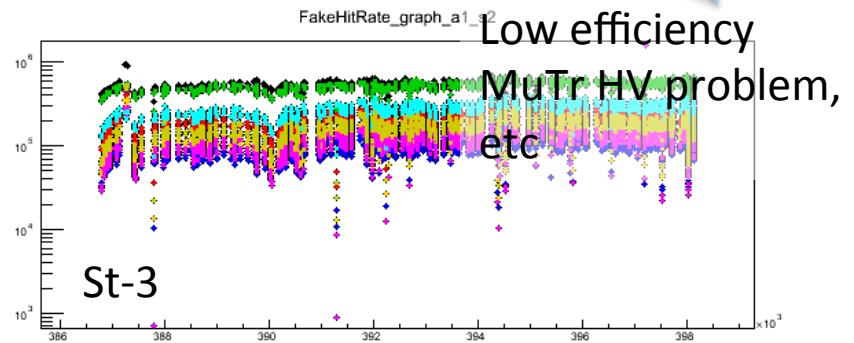
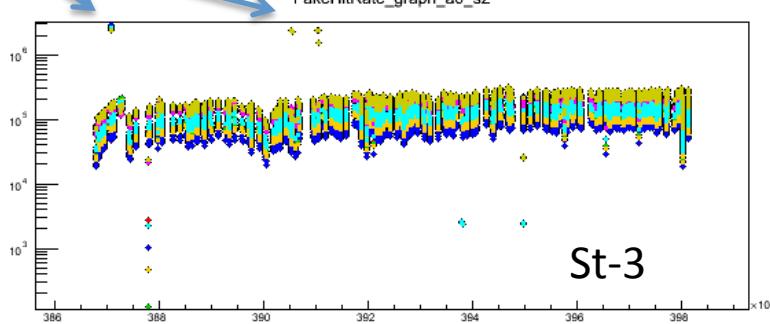
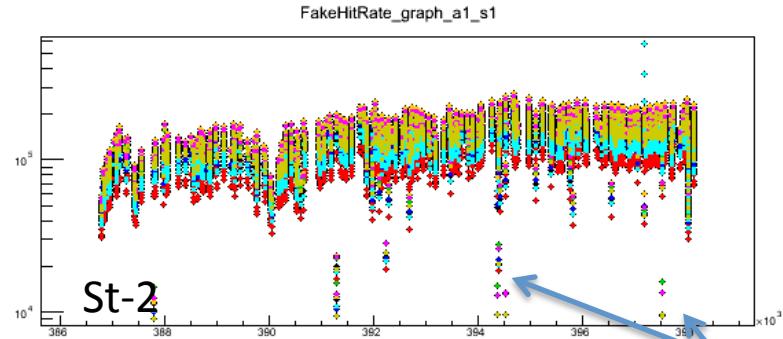
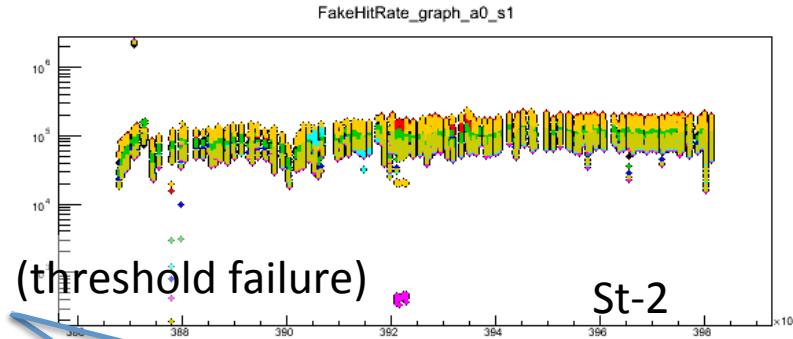
South



North



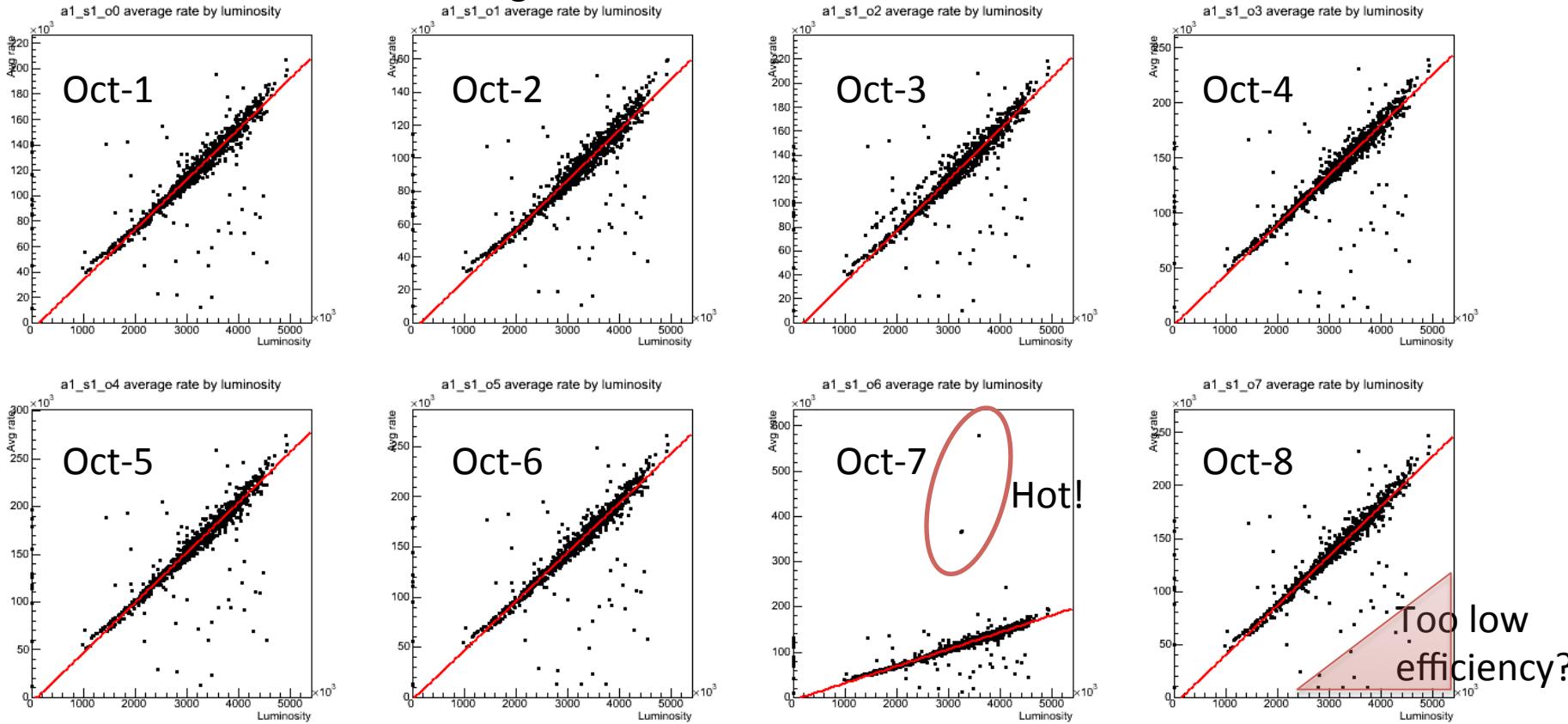
Hot! (threshold failure)



Overall stable. Shallow slop may come from luminosity increase.

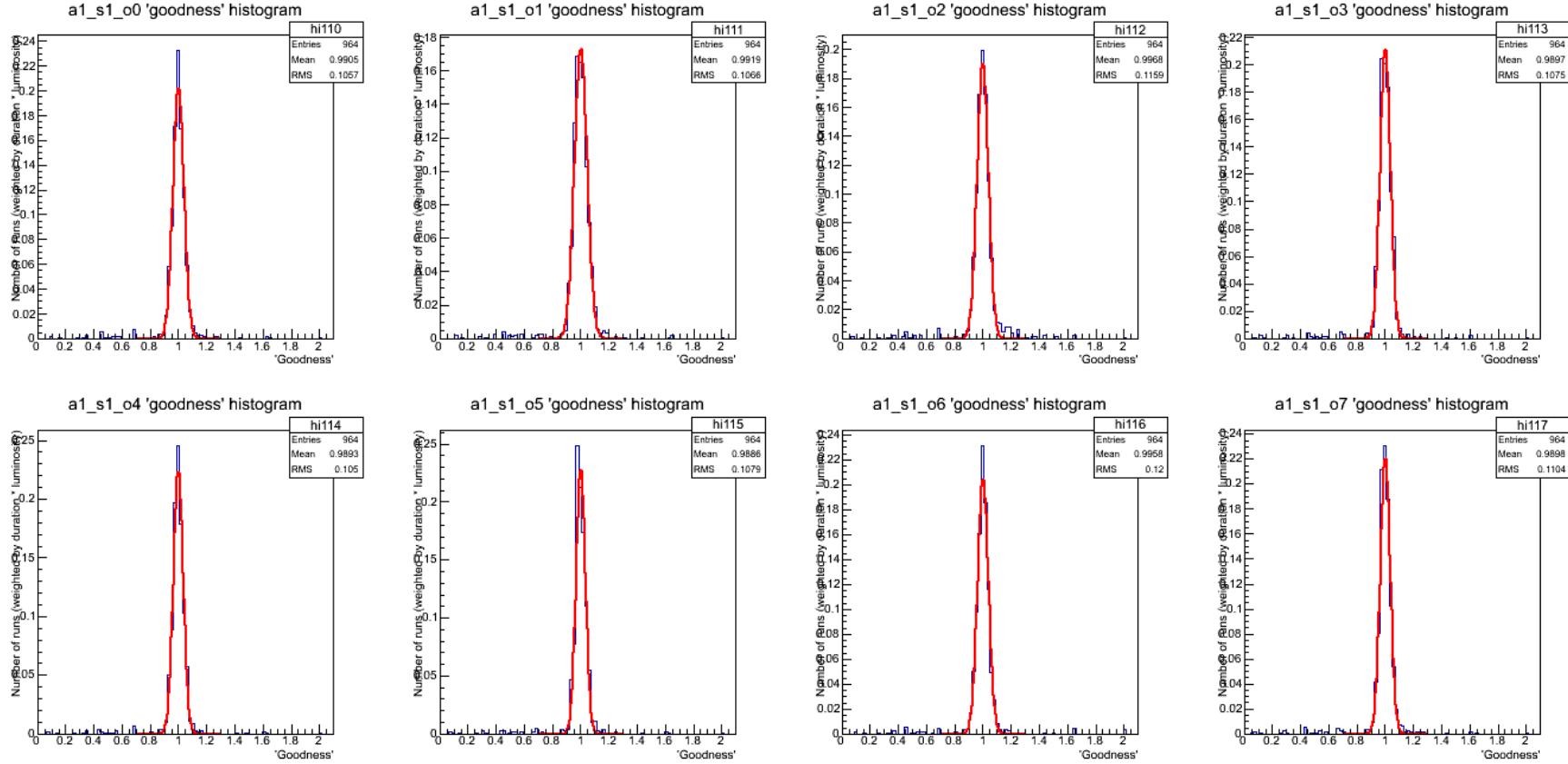
Fake Hit Rates vs. BBC Rate

North Station-2 Octant Average Hit Rates



Fake Hit Rates are sampled from abort gap, however it is not free from beam effect presumably due to long time constant of MuTr signal. So Fake rates are linearly proportional to BBC rate. Thus data/(linear fit) should distribute around 1.

North Station-2 Data / Linear Fit Distribution

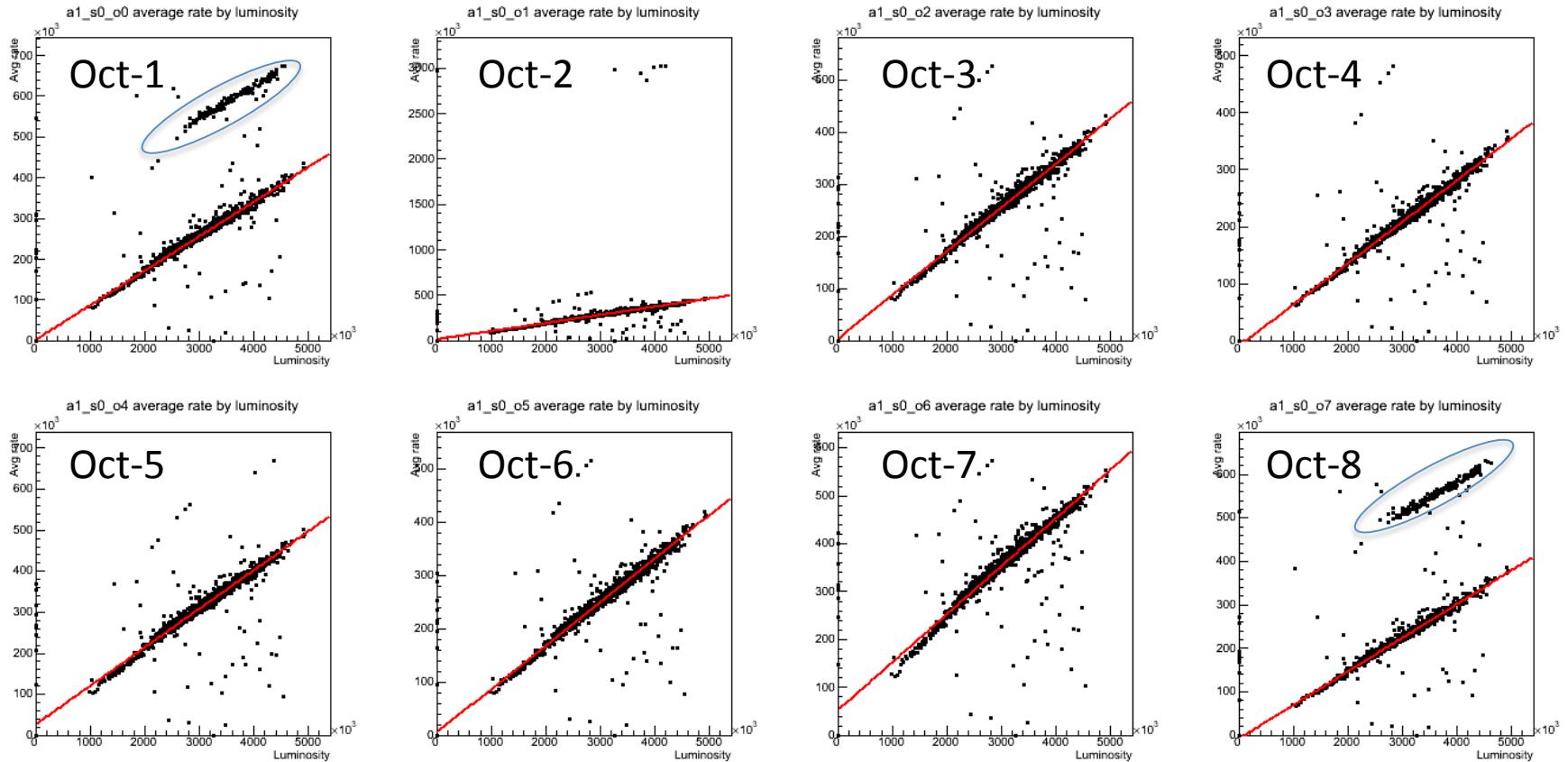


Octant	South	North
1	96,1	95,4
2	96,6	95,4
3	95,7	91,9
4	96,0	94,9
5	89,7	94,9
6	91,1	94,6
7	92,6	95,0
8	94,6	94,5

<- Fraction of data within 3 sigma (may be tight) of Gaussian distribution. Mostly >90%.

Fake Hit Rates vs. BBC Rate

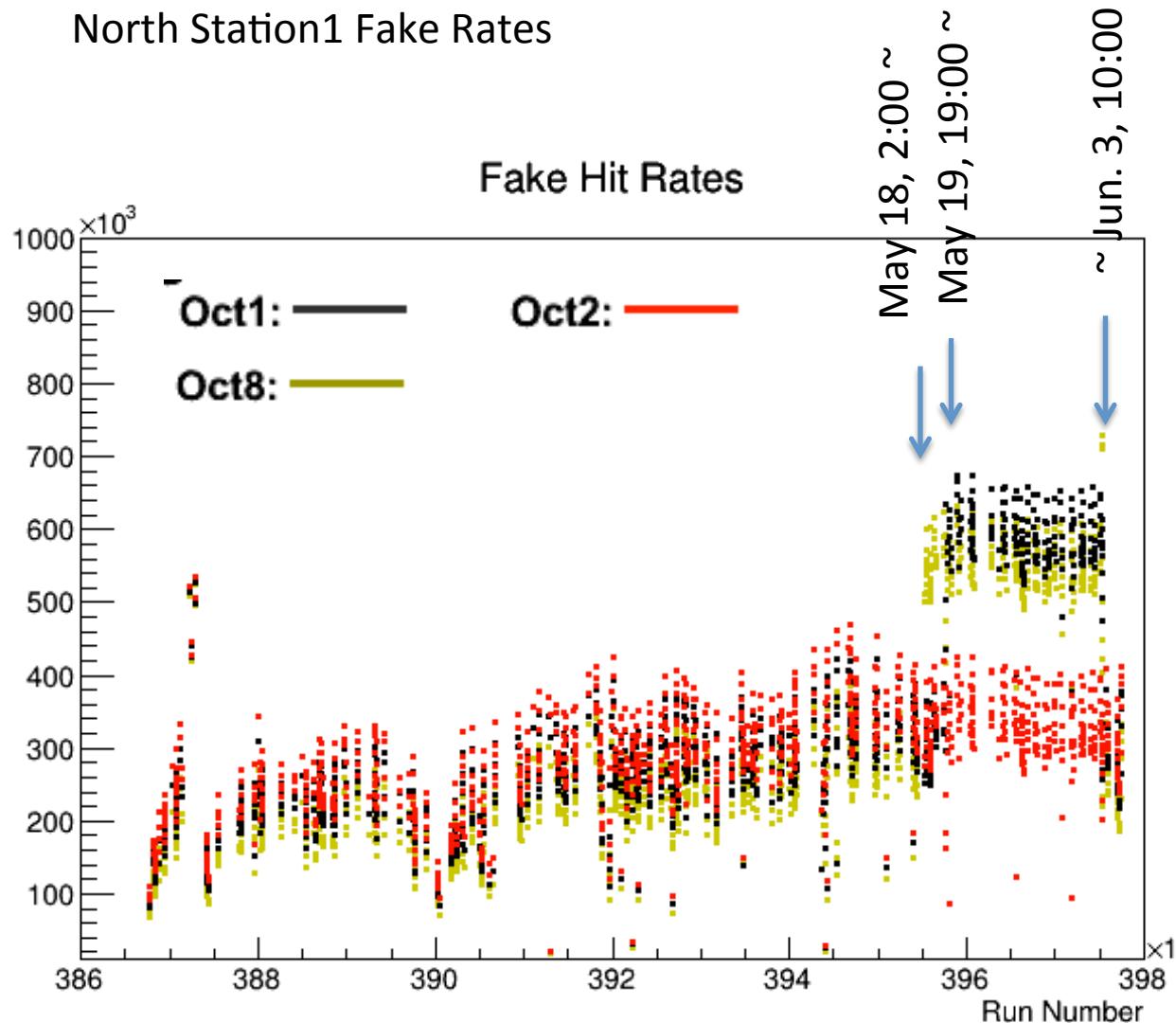
North Station-1 Octant Average Hit Rates



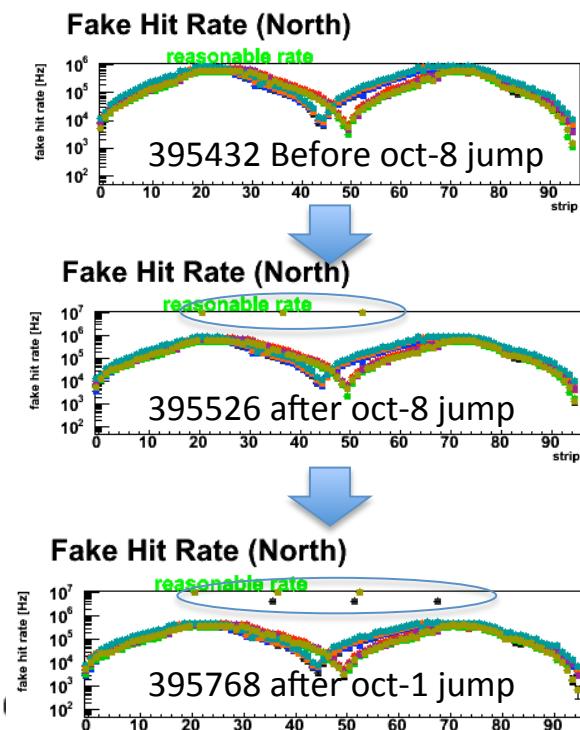
Octant-1 and Octant-8 shows double band.

Fake Rates Close Look

North Station1 Fake Rates



The fake rates of oct-1, 8 jumped by about double.
Timing is a part by 1.5days.
The fake rates of both octants came back to as they used to be at the same time.



South Fake Rates Close Look

Oct1: —

Oct5: —

Oct2: —

Oct6: —

Oct3: —

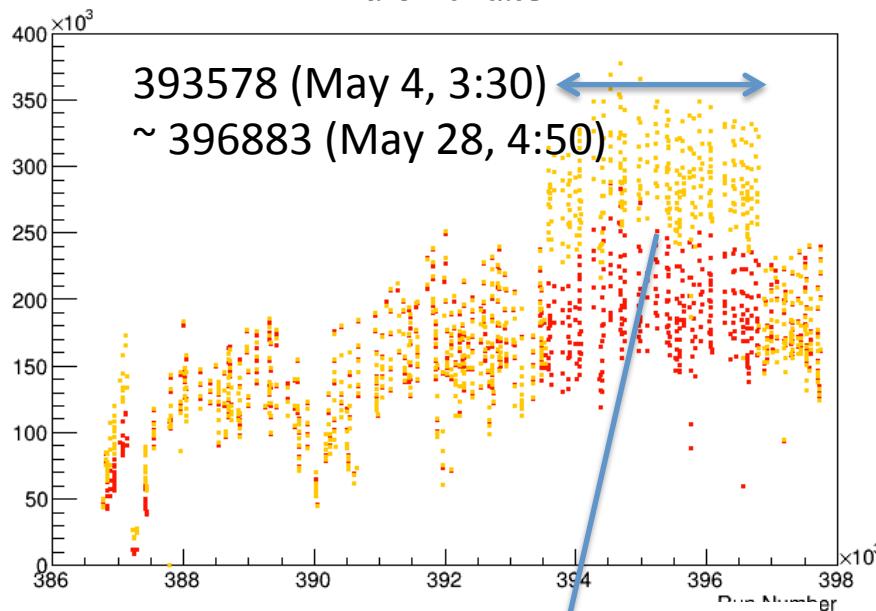
Oct7: —

Oct4: —

Oct8: —

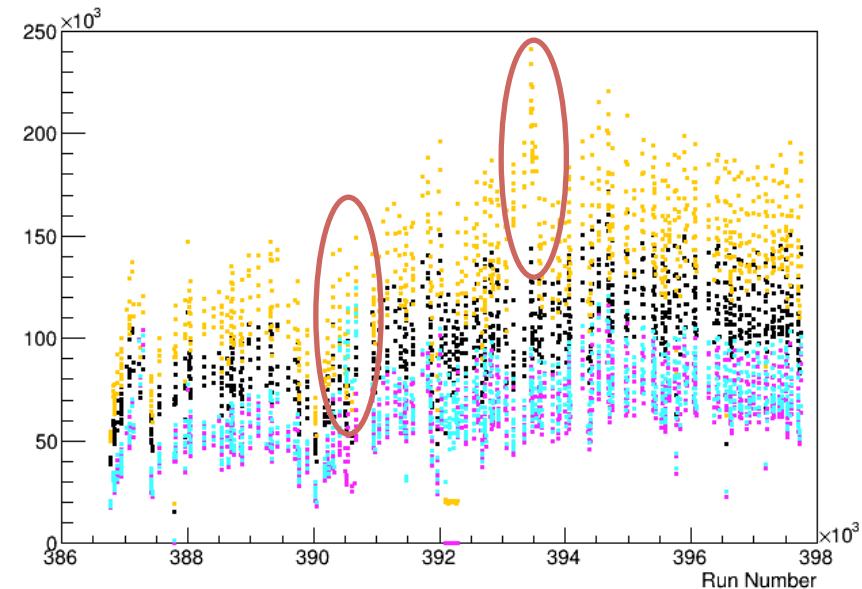
Station-1

Fake Hit Rates



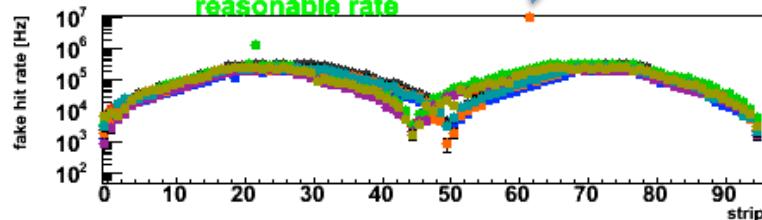
Station-2

Fake Hit Rates



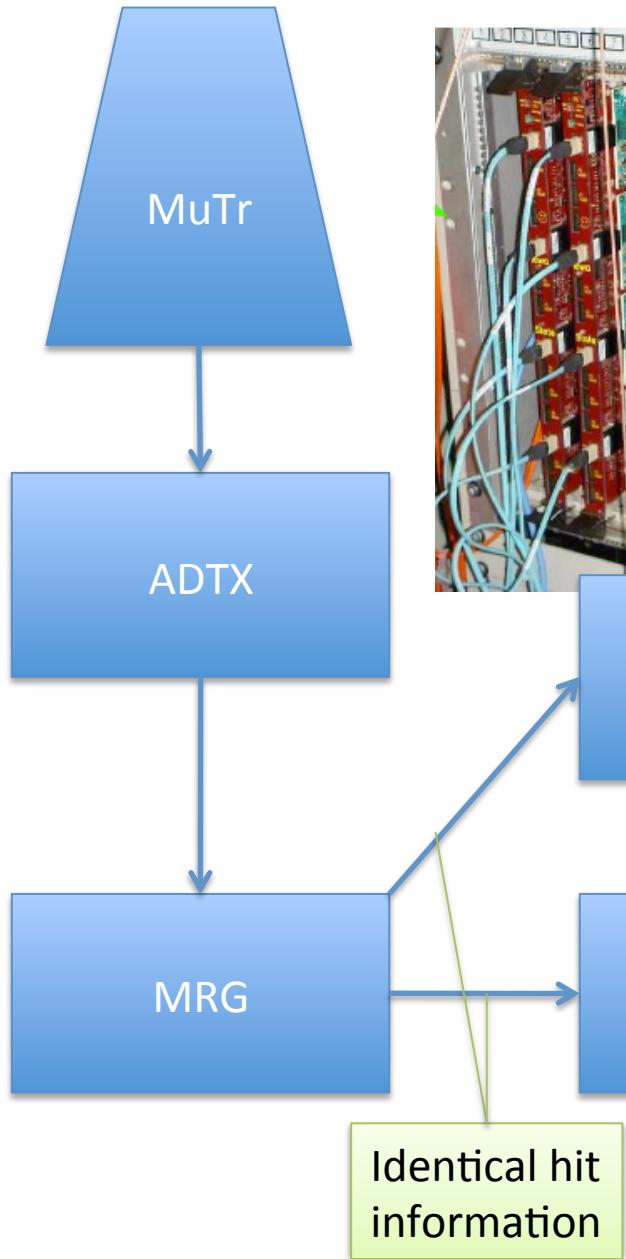
Fake Hit Rate (South)

reasonable rate

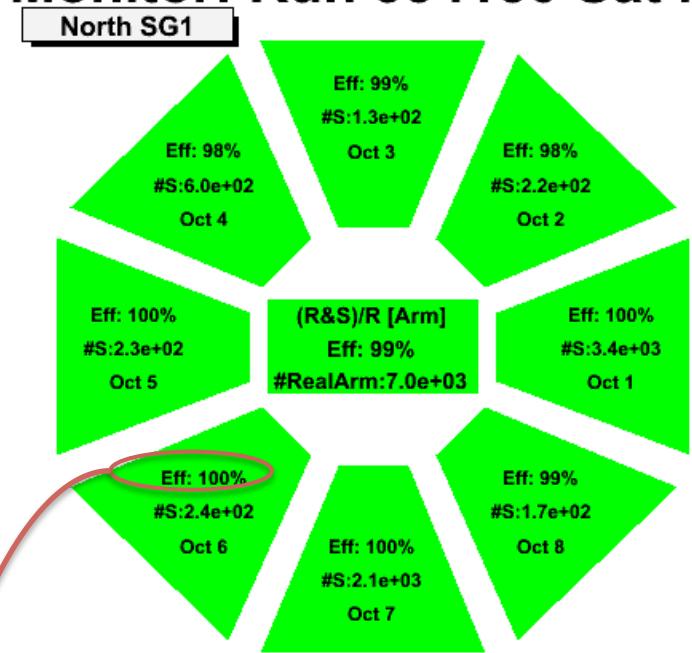


Sudden rate change is most likely to be caused by hot strip appears and disappears after a while. So the trigger should be OK.

SG1-LL1 Efficiencies



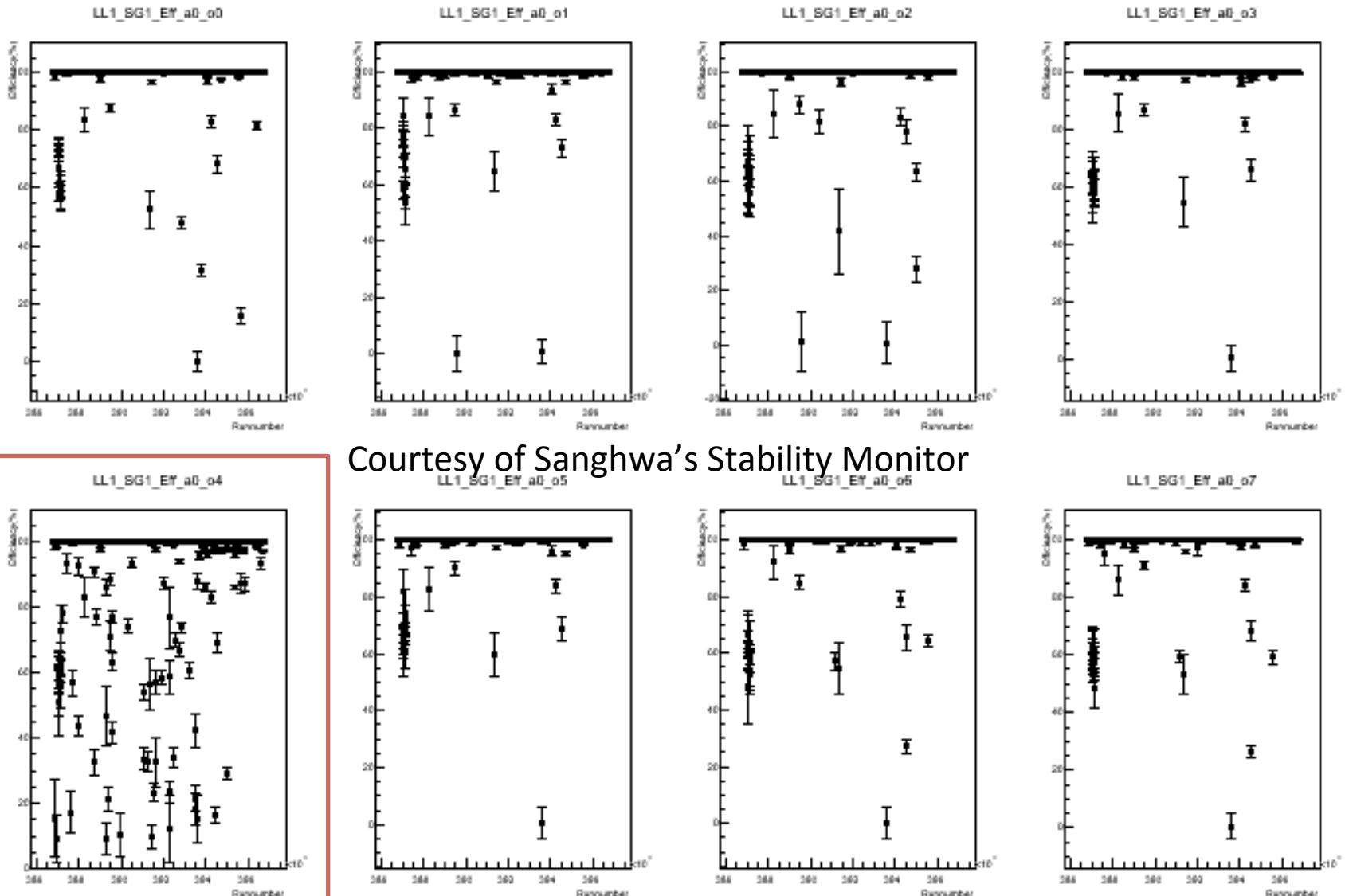
LL1 boards
developed by
U.Iowa



Josh Perry's Online Monitor

$$\text{Efficiency} = \frac{\# \text{ hits processed thru LL1}}{\# \text{ hits processed thru DCMIF}}$$

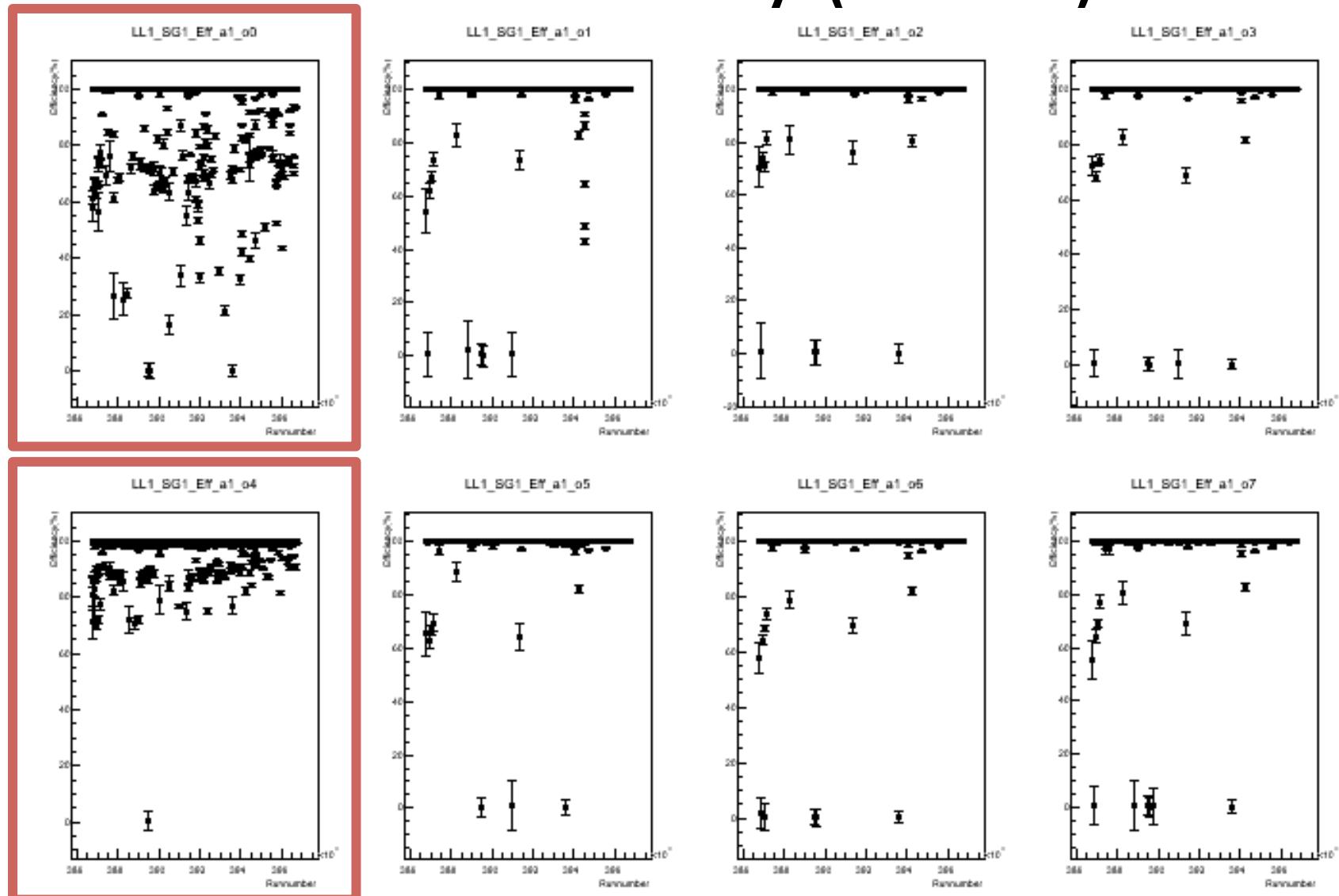
LL1 Efficiency (South)



Courtesy of Sanghwa's Stability Monitor

Overall, good efficiency except for more frequent efficiency drop in Octant-5 than others (known from Run12).

LL1 Efficiency (North)



Relatively frequent low efficiency seen in Octant-1 and 5. These tiles are located at same location on the LL1 board (not clear if it is correlated).

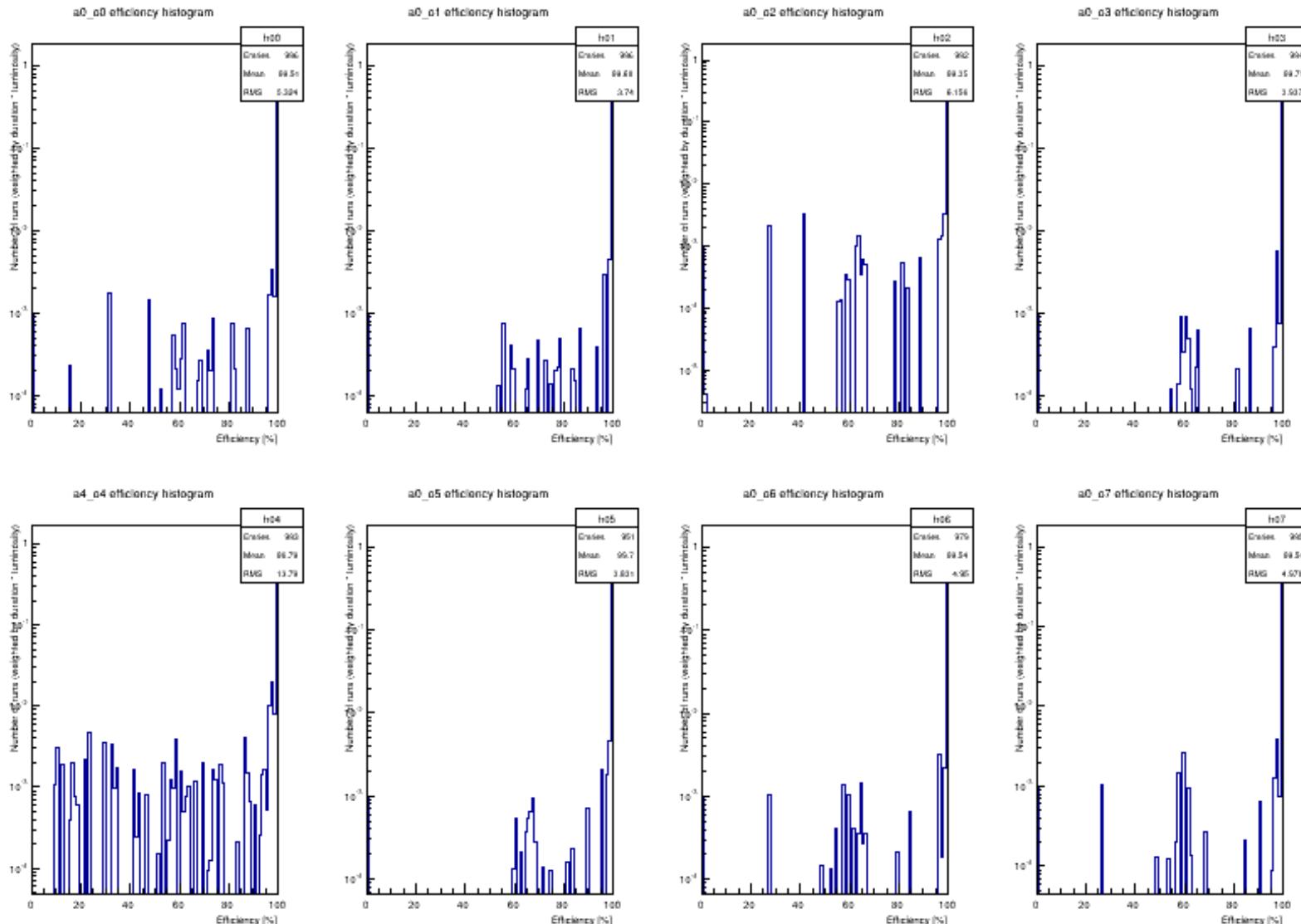
Luminosity Weighted Average Efficiency

$$Average\ Efficiency = \frac{\sum_i^{Run} Efficiency_i}{Run}$$

$$Weighted\ Average\ Efficiency = \frac{\sum_i^{Run} Lumi_i \cdot Efficiency_i}{\sum_i^{Run} Lumi_i}$$

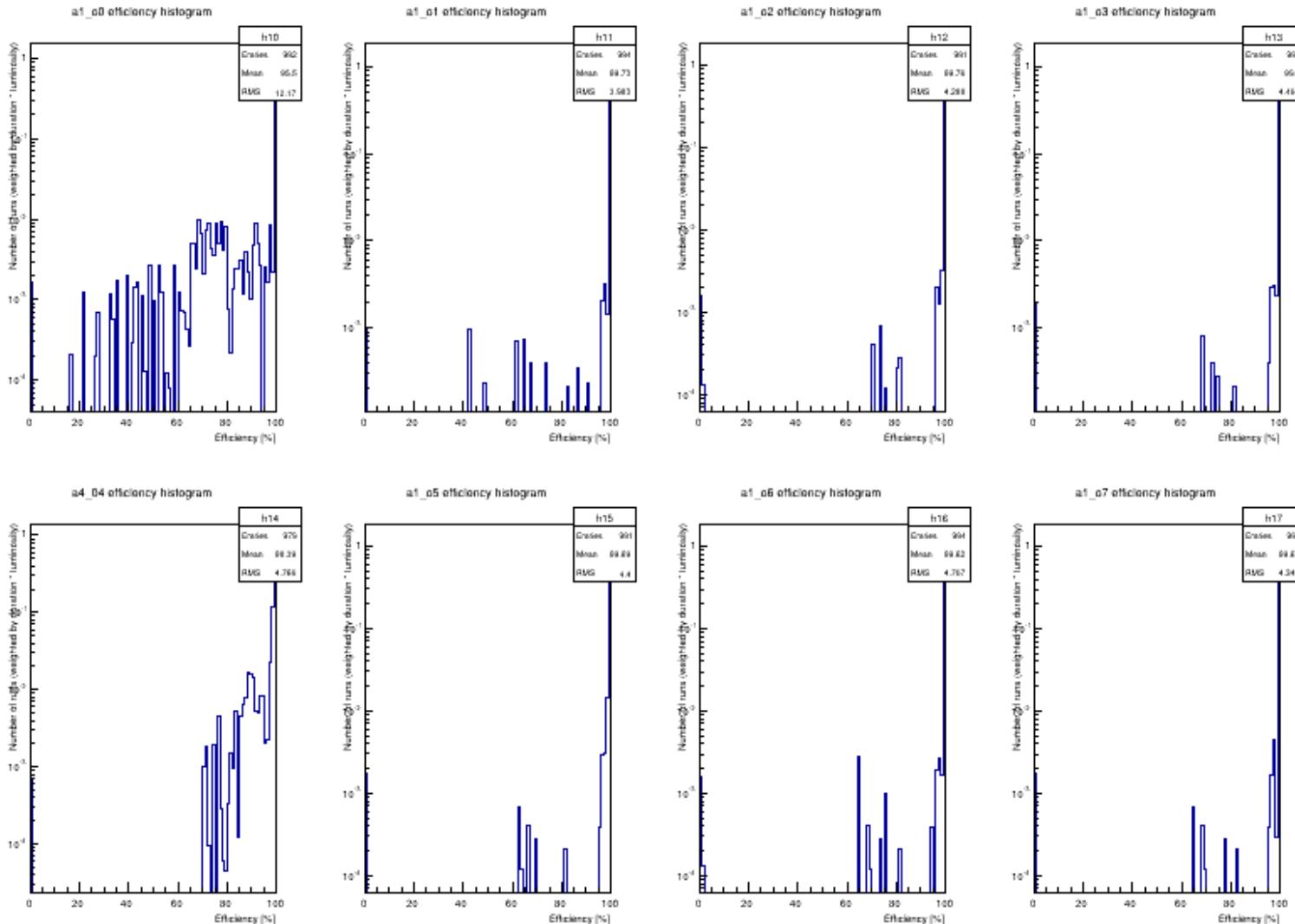
LL1 Efficiency (South)

Lumi Weighted



LL1 Efficiency (North)

Lumi Weighted



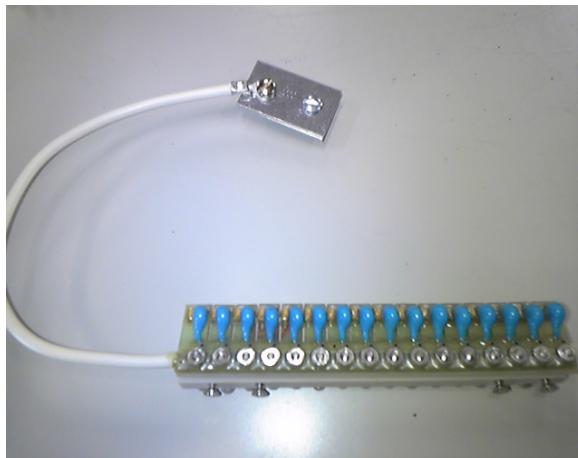
LL1 Efficiency Weighted Average

Octant	South	North
1	99.5 %	95.5 %
2	99.7	99.7
3	99.3	99.8
4	99.7	99.7
5	96.8	98.3
6	99.7	99.7
7	99.5	99.6
8	99.5	99.7

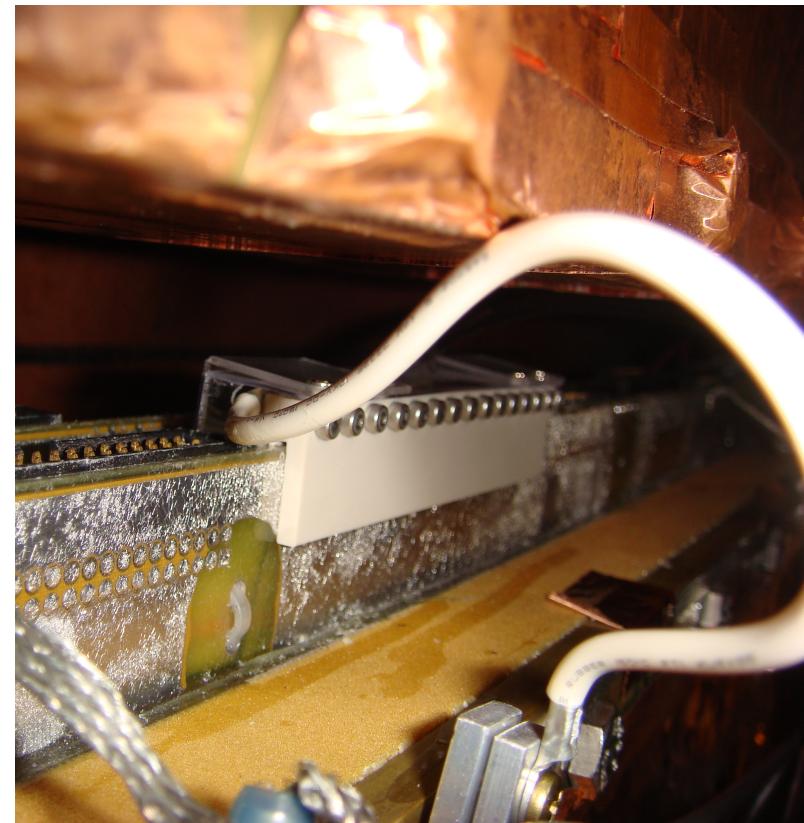
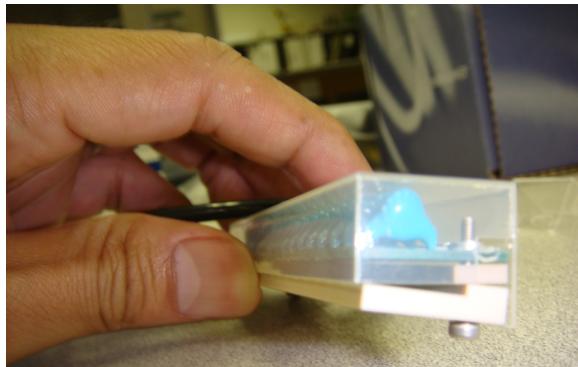
Over all LL1 efficiency > 98% except for N.Oct1~95%

MUTR PERFORMANCE

Station-3 and Dry Air System



clamp



MuTr HV @ Beginning of Run13

- South is in good shape.
- North: N341-1 draws high current. (current is fluctuating ~7 - 13 μA. Sometimes much higher)
- Increased dry air flow for north octant4, and keep monitoring.

South Arm

Feb 4 14:07:53 SOUTH MUON TRACKER HV SUMMARY												
S111	S112	S113	S121	S122	S123	S131	S132	S133	S141	S142	S143	
1915.3	1985.8	1915.8	1895.2	1885.4	1896.1	1895.4	1874.7	1885.4	1915.8	1985.1	1915.4	
-0.03	-0.00	0.03	0.01	-0.01	0.06	-0.03	0.00	0.00	0.00	-0.01	0.04	
0.00	-0.06	0.00	0.00	0.00	0.05	-0.02	0.08	-0.01	-0.01	0.00	0.01	
0.00	0.00	-0.03	0.02	0.03	0.05	0.06	0.00	0.00	-0.02	0.00	0.03	
0.01	0.01	0.00	-0.02	0.01	0.04	-0.01	0.01	0.01	-0.02	0.01	0.04	
-0.01	0.00	-0.06	0.00	0.02	0.04	0.00	0.00	-0.01	0.00	0.01	0.01	
0.00	0.02	0.00	0.01	0.00	0.05	-0.03	0.00	0.00	0.00	0.03	-0.01	
S151	S152	S153	S161	S162	S163	S171	S172	S173	S181	S182	S183	
1896.8	1916.2	1895.8	1878.8	1885.8	1914.9	1924.1	1895.2	1897.2	1986.7	1984.8	1915.2	
-0.03	-0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	0.00	-0.01	
0.00	0.00	0.01	0.08	0.06	0.00	-0.04	0.00	-0.03	0.02	0.00	-0.01	
0.04	0.05	0.00	0.05	0.85	0.02	0.01	0.00	-0.02	0.01	-0.01	0.01	
0.00	0.01	0.00	0.03	0.07	0.00	0.03	0.00	0.02	0.00	-0.03	-0.01	
0.04	0.05	0.00	0.06	0.05	0.01	0.00	0.00	0.00	0.00	-0.09	0.01	
-0.01	0.00	0.00	0.05	0.09	0.00	0.01	-0.01	0.00	0.02	0.02	0.00	
0.01	0.00	-0.03	0.07	0.03	0.02	0.00	-0.05	0.04	0.04	0.00	0.00	
S211	S213	S222	S231	S233	S242	S251	S253	S262	S271	S273	S282	
1949.3	1939.7	1941.4	1938.3	1939.8	1950.4	1951.8	1968.7	1921.2	1928.6	1921.1	1931.2	
0.02	-0.55	0.01	0.02	0.00	0.02	0.00	0.00	-0.03	0.05	-0.03	0.02	
0.02	0.00	0.05	0.02	0.01	0.00	0.00	0.00	0.00	0.04	0.00	0.02	
0.00	-0.17	0.00	0.05	0.02	0.04	0.00	0.00	-0.01	0.06	-0.02	0.00	
0.35	-0.11	0.00	-0.01	0.01	0.06	0.02	-0.02	0.01	0.02	0.02	0.01	
0.01	-0.07	0.01	0.01	0.01	0.01	0.00	-0.02	-0.01	0.01	0.04	0.03	
-0.02	-0.11	-0.02	-0.01	0.00	0.02	0.01	-0.01	-0.01	0.03	0.00	0.02	
-0.01	-0.09	0.00	-0.02	0.03	0.00	0.04	-0.03	-0.03	0.02	0.00	0.00	
0.00	-0.08	0.00	0.03	0.04	0.00	0.02	-0.02	0.00	0.01	0.01	0.00	
S311	S321	S331	S341	S351	S361	S371	S381					
1974.7	1975.2	1967.8	1947.9	1934.9	1976.8	1965.5	1975.8					
-0.03	0.04	0.06	0.03	-0.01	0.02	0.10	0.00					
-0.05	0.04	0.00	0.00	-0.04	0.02	0.05	0.02					
0.04	0.02	0.01	0.01	0.00	0.00	0.04	0.00					
-0.01	0.00	0.00	0.04	0.02	0.00	0.03	0.05					
-0.02	0.01	-0.01	0.04	0.03	0.00	0.10	0.01					
-0.03	0.02	0.13	0.05	0.01	0.01	-0.01	-0.01					
0.00	0.00	0.06	0.08	0.04	0.01	0.04	0.00					
0.15	-0.01	0.05	0.01	0.02	0.02	0.07	0.01					
about 30 seconds till the next update... Type n s x for North, South or Exit												

North Arm

Feb 4 16:50:20 NORTH MUON TRACKER HV SUMMARY												
N111	N112	N113	N121	N122	N123	N131	N132	N133	N141	N142	N143	
1985.7	1926.8	1884.4	1895.1	1984.8	1915.1	1915.9	1924.7	1895.1	1875.2	1915.6	1874.8	
0.43	0.47	0.45	0.49	0.48	0.49	0.48	0.49	0.47	0.49	0.47	0.40	
0.58	0.49	0.48	0.46	0.50	0.51	0.49	0.58	0.51	0.46	0.46	0.48	
0.48	0.49	0.47	0.48	0.48	0.48	0.47	0.52	0.48	0.46	0.48	0.45	
0.48	0.49	0.46	0.58	0.47	0.46	0.46	0.50	0.50	0.47	0.46	0.55	
0.51	0.49	0.48	0.49	0.49	0.51	0.47	0.50	0.50	0.47	0.46	0.47	
0.46	0.49	0.58	0.50	0.47	0.47	0.47	0.48	0.49	0.48	0.47	0.48	
0.48	0.49	0.45	0.58	0.48	0.50	0.52	0.49	0.48	0.47	0.49	0.46	
0.48	0.46	0.46	0.58	0.46	0.48	0.50	0.48	0.49	0.45	0.47	0.48	
N151	N152	N153	N161	N162	N163	N171	N172	N173	N181	N182	N183	
1925.1	1985.3	1925.3	1924.1	1895.6	1916.5	1924.7	1924.8	1925.8	1884.8	1915.7	1915.2	
0.50	0.48	0.49	0.48	0.48	0.46	0.51	0.47	0.48	0.45	0.49	0.49	
0.47	0.49	0.48	0.58	0.52	0.49	0.49	0.58	0.49	0.39	0.49	0.49	
0.47	0.47	0.48	0.47	0.50	0.47	0.48	0.47	0.48	0.52	0.51	0.47	
0.58	0.49	0.49	0.47	0.48	0.47	0.48	0.47	0.48	0.49	0.51	0.49	
0.58	0.48	0.48	0.53	0.47	0.46	0.48	0.48	0.48	0.48	0.49	0.47	
0.47	0.46	0.49	0.49	0.47	0.47	0.50	0.48	0.49	0.49	0.48	0.46	
0.47	0.48	0.48	0.49	0.46	0.48	0.51	0.47	0.47	0.46	0.48	0.47	
0.47	0.48	0.48	0.49	0.48	0.49	0.51	0.46	0.49	0.48	0.47	0.47	
N211	N213	N222	N231	N233	N242	N251	N253	N262	N271	N273	N282	
1949.8	1958.6	1921.1	1958.8	1951.1	1939.6	1949.5	1949.2	1949.6	1949.8	1949.7	1958.4	
0.59	0.52	0.58	0.49	0.46	0.49	0.47	0.55	0.48	0.49	0.49	0.49	
0.45	0.53	0.49	0.49	0.48	0.50	0.49	0.46	0.46	0.47	0.47	0.47	
0.49	0.47	0.49	0.51	0.51	0.50	0.50	0.49	0.46	0.49	0.47	0.48	
0.48	0.51	0.47	0.52	0.50	0.48	0.48	0.47	0.43	0.48	0.48	0.49	
0.51	-0.01	0.47	0.58	0.48	0.48	0.43	0.48	0.52	0.47	0.50	0.48	
0.59	-0.01	0.67	0.52	0.52	0.49	0.58	0.43	0.48	0.50	0.50	0.58	
0.50	0.47	0.46	0.51	0.52	0.51	0.54	0.45	0.51	0.51	0.58	0.47	
0.51	0.41	0.44	0.50	0.49	0.48	0.51	0.47	0.50	0.50	0.52	0.49	
N311	N321	N331	N341	N351	N361	N371	N381					
1975.8	1955.1	1975.7	1975.1	1976.1	1975.6	1975.5	1975.1					
0.59	0.89	1.07	0.72	0.48	0.43	0.52	0.52					
0.52	0.88	1.08	0.53	0.53	0.53	0.53	0.56					
0.58	0.89	1.02	0.52	0.49	0.48	0.58	0.49					
0.56	0.83	1.05	0.46	0.48	0.53	0.54	0.51					
0.52	0.95	1.05	0.51	0.51	0.53	0.59	0.51					
0.55	0.86	1.05	0.52	0.49	0.54	0.53	0.43					
0.54	0.91	1.03	0.49	0.47	0.50	0.49	0.50					
0.54	0.84	1.02	0.57	0.48	0.50	0.48	0.51					
about 30 seconds till the next update... Type n s x for North, South or Exit												

HV Status at the End of Run13

South HV

SOUTH MUON TRACKER HV SUMMARY												
S111	S112	S113	S121	S122	S123	S131	S132	S133	S141	S142	S143	
1915.3	1905.8	1915.9	1895.1	1885.5	1895.3	1894.4	1873.8	1885.4	1915.8	1905.1	1914.5	
0.48	0.55	0.48	0.39	0.44	0.44	0.64	0.73	0.49	0.37	0.58	0.67	
0.50	0.48	0.58	0.45	0.46	0.50	0.36	0.94	0.43	0.48	0.51	0.59	
0.36	0.40	0.38	0.27	0.29	0.37	0.38	0.71	0.34	0.34	0.51	0.45	
0.48	0.40	0.44	0.30	0.00	0.30	0.26	0.64	0.33	0.37	0.40	0.33	
0.30	0.34	0.29	0.34	0.22	0.23	0.26	0.55	0.32	0.32	0.26	0.30	
0.28	0.20	0.34	0.34	0.25	0.26	0.17	0.66	0.16	0.26	0.24	0.40	
S151	S152	S153	S161	S162	S163	S171	S172	S173	S181	S182	S183	
1895.9	1916.2	1895.8	1879.7	1885.8	1914.9	1925.8	1896.3	1985.8	1984.8	1914.3		
0.00	0.79	0.42	0.39	0.45	0.47	0.34	0.45	0.48	0.02	0.38	0.67	
0.62	0.55	0.52	0.52	0.50	0.44	0.50	0.35	0.44	0.43	0.50	0.59	
0.44	0.35	0.39	0.34	0.42	0.49	0.35	0.44	0.33	0.50	0.38	0.49	
0.46	0.43	0.28	0.37	0.34	0.40	0.33	0.23	0.38	0.34	0.35	0.49	
0.27	0.44	0.36	0.34	0.30	0.32	0.40	0.38	0.00	0.25	0.33	0.29	
0.27	0.19	0.17	0.33	0.26	0.47	0.26	0.20	0.38	0.27	0.38	0.31	
S211	S213	S222	S231	S233	S242	S251	S253	S262	S271	S273	S282	
1958.2	1948.6	1941.4	1929.4	1939.8	1958.4	1958.5	1899.7	1922.2	1919.7	1921.1	1931.2	
0.59	-0.55	0.32	0.67	0.19	0.62	0.52	0.18	0.31	0.55	0.33	0.62	
0.67	0.44	0.45	0.64	0.45	0.58	0.54	0.30	0.21	0.47	0.47	0.10	
0.62	-0.17	0.58	0.83	0.62	0.77	0.69	0.44	0.44	0.48	0.36	0.45	
0.35	0.65	0.76	0.86	0.83	0.66	0.64	0.38	0.47	0.49	0.39	0.49	
0.35	0.53	0.41	0.73	0.64	0.69	0.58	0.28	0.46	1.27	0.33	0.48	
0.66	0.32	0.37	0.58	0.53	0.49	0.52	0.32	0.44	0.42	0.25	0.31	
0.77	0.46	0.50	0.75	0.66	0.66	0.56	0.36	0.41	0.36	0.23	0.57	
0.65	0.41	0.55	0.94	0.67	0.68	0.68	0.40	0.48	0.43	0.30	0.51	
S311	S321	S331	S341	S351	S361	S371	S381					
1975.6	1975.2	1966.1	1944.8	1934.9	1975.1	1964.3	1976.8					
0.43	0.51	0.76	1.36	0.30	1.04	0.90						
0.62	0.96	0.68	0.61	0.86	0.94	0.61	1.15					
0.87	0.96	0.81	1.45	1.76	1.28	1.14	1.53					
0.35	0.37	0.34	1.21	0.82	0.58	0.66	0.77					
0.31	0.35	0.43	0.58	1.33	1.14	0.42	0.28					
0.72	0.77	1.13	1.20	0.79	1.78	0.44	0.70					
0.93	1.12	1.11	1.26	1.53	2.4	0.94	0.76					
0.49	0.40	0.65	0.69	0.98	0.46	0.46						
about 30 seconds till the next update...												
Type n s x for North, South or Exit												

Disabled May 11

North HV

NORTH MUON TRACKER HV SUMMARY												
N111	N112	N113	N121	N122	N123	N131	N132	N133	N141	N142	N143	
1985.7	1926.8	1884.4	1895.1	1985.7	1916.8	1915.8	1924.7	1895.1	1874.3	1915.6	1874.8	
0.74	0.74	0.76	0.68	0.74	0.81	0.79	0.78	0.78	0.46	0.81	0.64	
0.79	0.94	0.80	0.80	0.82	0.88	0.97	0.92	0.77	0.88	0.77	0.77	
1.09	1.43	1.08	1.11	1.13	1.08	1.10	1.21	1.09	0.99	1.48	1.05	
1.37	1.49	1.12	1.37	1.28	1.22	1.32	1.41	1.21	0.96	1.37	1.08	
1.14	1.22	0.93	1.26	1.11	1.37	1.04	1.20	1.02	0.86	1.12	1.00	
1.03	1.04	0.89	1.02	0.91	0.96	0.97	1.05	0.86	0.80	1.07	0.85	
1.06	1.01	0.90	0.89	0.90	0.92	0.96	0.82	0.79	0.91	0.80	0.80	
0.85	0.99	0.77	0.77	0.80	0.92	0.76	0.89	0.82	0.69	0.88	0.77	
N151	N152	N153	N161	N162	N163	N171	N172	N173	N181	N182	N183	
1924.2	1905.3	1924.4	1924.1	1895.6	1916.5	1924.7	1923.9	1924.9	1884.8	1915.7	1915.2	
0.89	0.79	0.83	0.75	0.76	0.75	0.80	0.79	0.82	1.06	0.49	0.56	
1.05	0.93	0.98	1.00	0.89	0.80	0.86	0.95	0.83	1.19	1.17	0.93	
1.54	1.13	1.40	1.18	1.11	1.12	1.24	1.32	1.19	1.79	1.21	1.19	
1.51	1.28	1.51	1.46	1.19	1.28	1.44	1.42	1.25	1.64	1.39	1.33	
1.36	0.98	1.16	1.32	0.99	0.99	1.19	0.95	1.15	1.51	1.11	1.15	
1.18	0.94	1.17	1.14	0.47	0.91	1.05	0.98	1.04	1.67	1.19	0.91	
1.06	0.93	1.03	0.91	0.91	0.95	1.03	1.08	0.97	1.27	0.93	0.97	
0.97	0.83	0.91	0.96	0.77	0.96	0.98	0.95	0.93	1.32	0.92	0.89	
N211	N213	N222	N231	N233	N242	N251	N253	N262	N271	N273	N282	
1949.8	1958.6	1928.2	1958.8	1951.1	1939.6	1949.5	1949.2	1958.5	1949.8	1949.7	1949.5	
1.06	0.75	0.55	1.81	0.72	0.96	1.17	1.05	0.95	1.02	0.78	0.80	
1.83	1.66	0.97	1.69	1.45	1.47	1.93	1.75	1.54	1.78	0.94	1.37	
1.22	1.24	1.07	1.21	1.08	1.08	1.23	1.07	1.09	1.02	1.15	1.25	
0.85	0.80	0.89	0.92	0.87	0.95	0.90	0.76	0.93	0.74	0.74	1.01	
1.05	---	0.94	1.07	1.11	0.90	1.04	1.06	0.96	1.08	1.00	0.97	
1.53	---	1.54	1.72	1.56	1.38	1.26	1.61	1.77	1.63	1.58	1.50	
1.03	1.18	0.98	1.11	1.12	1.11	1.41	1.21	1.08	1.12	1.06	1.15	
0.64	0.94	0.76	0.68	1.12	0.79	0.98	0.92	0.97	0.66	1.00	0.88	
N311	N321	N331	N341	N351	N361	N371	N381					
1974.1	1954.2	1974.8	1977.8	1975.2	1975.6	1975.5	1975.1					
1.05	1.05	1.20	1.74	1.24	1.25	1.17						
1.08	1.53	2.04	1.70	2.08	1.86	0.95						
1.78	1.46	1.76	2.07	2.08	1.76	1.74						
1.72	1.43	1.77	2.21	2.18	1.84	1.62						
1.20	1.18	1.71	1.92	1.82	1.14	1.26						
1.44	1.67	2.05	3.47	2.71	1.98	1.92						
1.50	1.45	1.96	2.89	2.36	1.76	1.61						
1.53	1.39	1.79	2.21	2.21	1.57	1.58						
about 30 seconds till the next update...												
Type n s x for North, South or Exit												

Disabled Feb.5

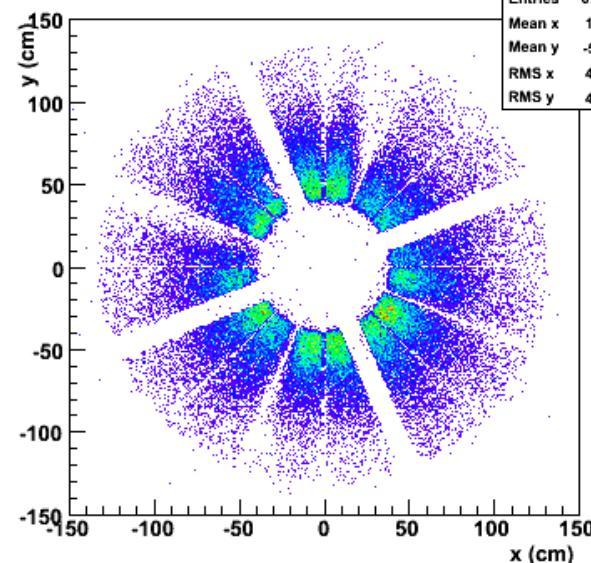
MuTr Disabled HV Channel History

Run	Date	South	North
13	Feb.4, 2013	3 (2)	2 (0)
	Jun.8, 2013	4 (1)	3 (1)
½ Clamp Install (Top Octants)			
12	Jan. 20, 2012	5 (4)	8 (2)
	Jun. 20, 2012	6 (4)	9 (3)
½ Clamp Install (Bottom Octants)			
11	Feb. 17, 2011	4 (3)	5 (2)
	Apr. 27, 2011	4 (3)	5 (2)
Cramp Prototype Test North Oct.6,7			
10	Jan. 25, 2010	2 (1)	3 (2)
	May 26, 2010	3 (2)	2 (2)
Decapacitation (South)			
9	Feb. 5, 2009	9 (5)	3 (0)
	Jul. 5, 2009	10 (5)	6 (2)
Decapacitation (North)			
8			27

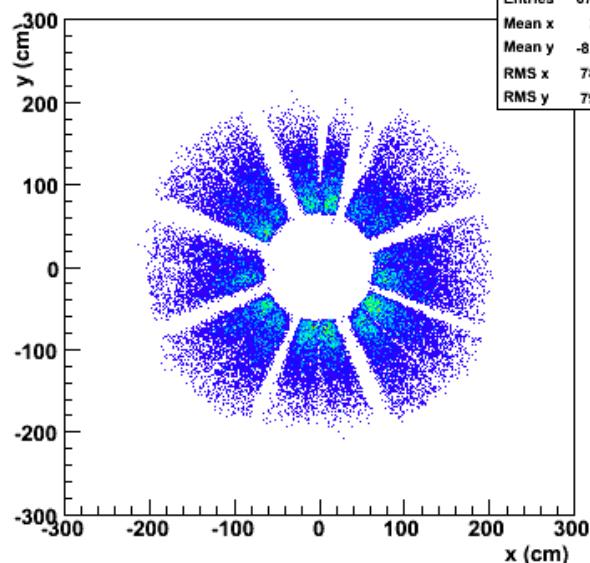
RUN13

Radio Graph (South) Reconstructed Tracks

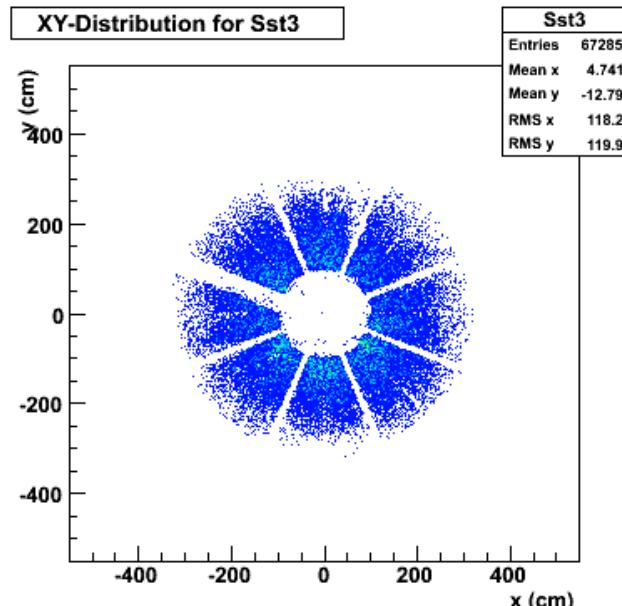
XY-Distribution for Sst1



XY-Distribution for Sst2



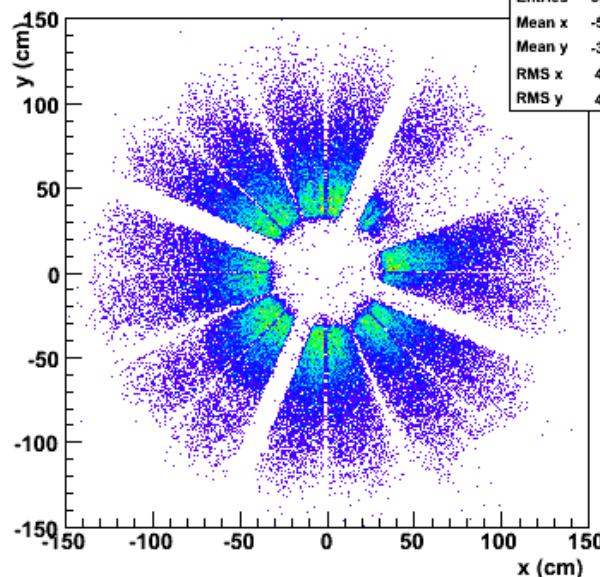
XY-Distribution for Sst3



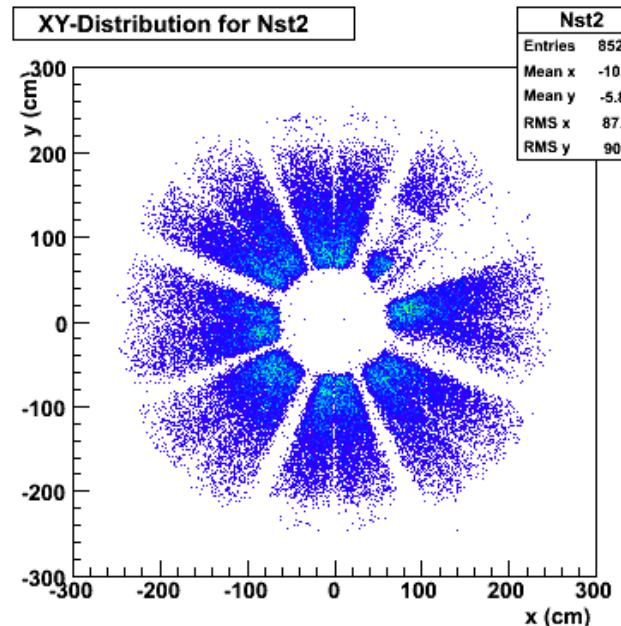
Plot by Margaret A. Jezghani (GSU)

Radio Graph (South) Reconstructed Tracks

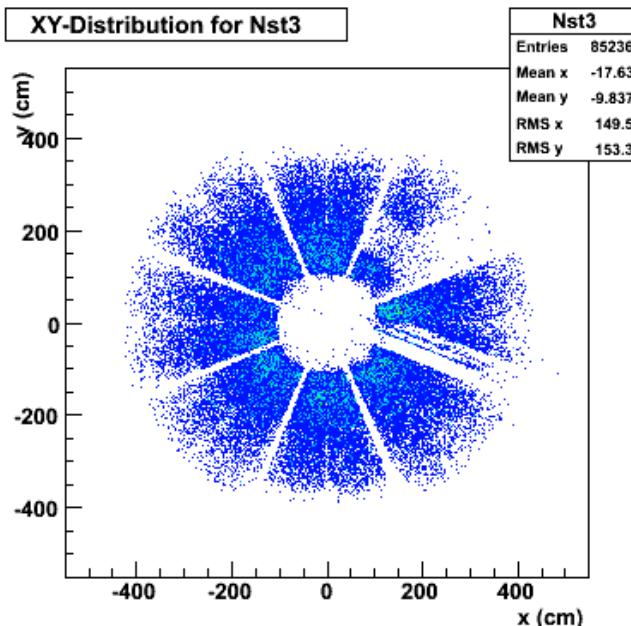
XY-Distribution for Nst1



XY-Distribution for Nst2



XY-Distribution for Nst3



Summary

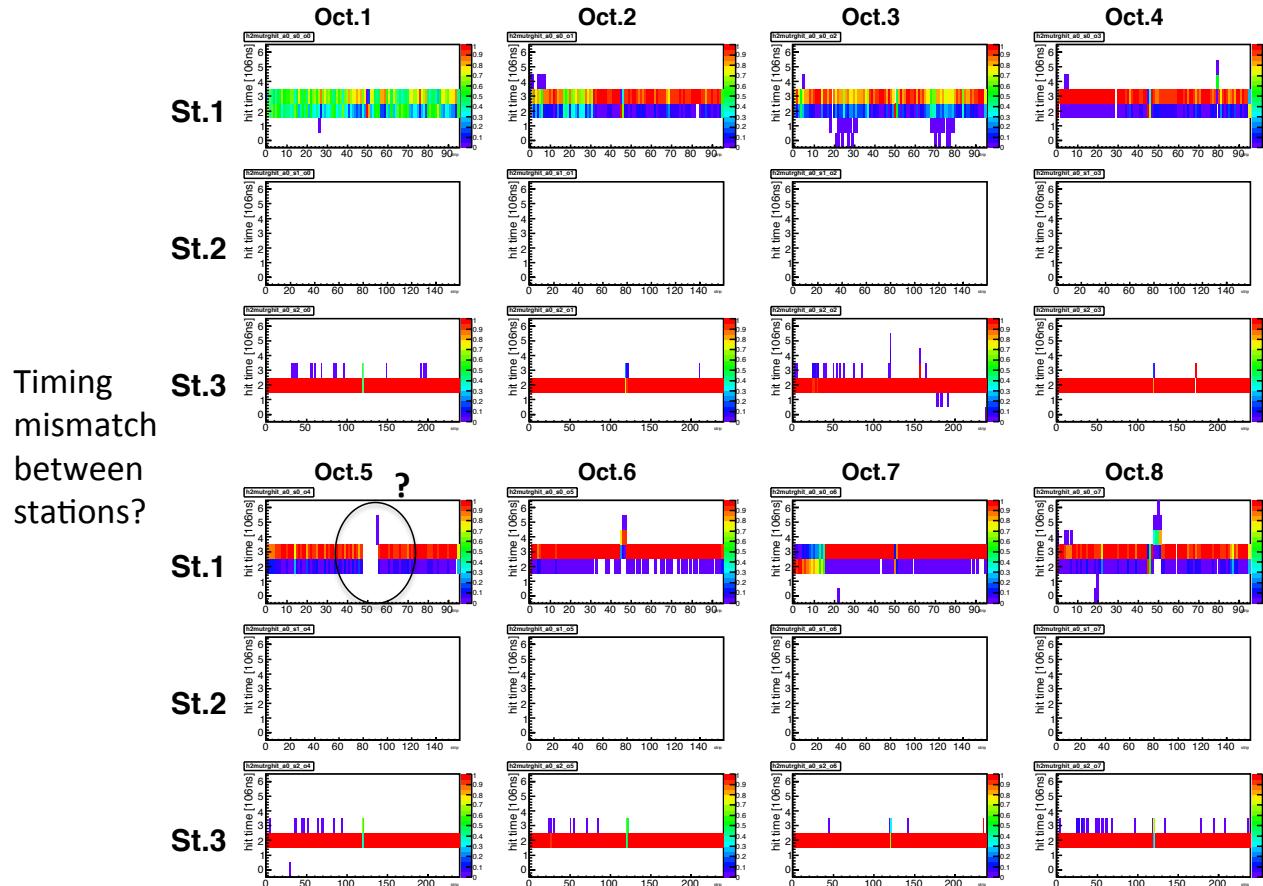
- Total W trigger rates (trigger mix SG1, RPC1&3, MUID) survived BBC~ 5MHz without prescaling.
- All ADTX/MRG remain unmasked except for temporary periods.
- LL1 Efficiency Occasional low efficiency observed in South Octant-5, North Octant-1 & 5 though, the luminosity and runtime weighted average turned out to be >95%.
- MuTr FEE also remained unmasked.
- MuTr HV are survived mostly, except for one channel which is masked in the middle of run.
- MuTr acceptance was active except for half octant in North arm.

SHUTDOWN PLAN

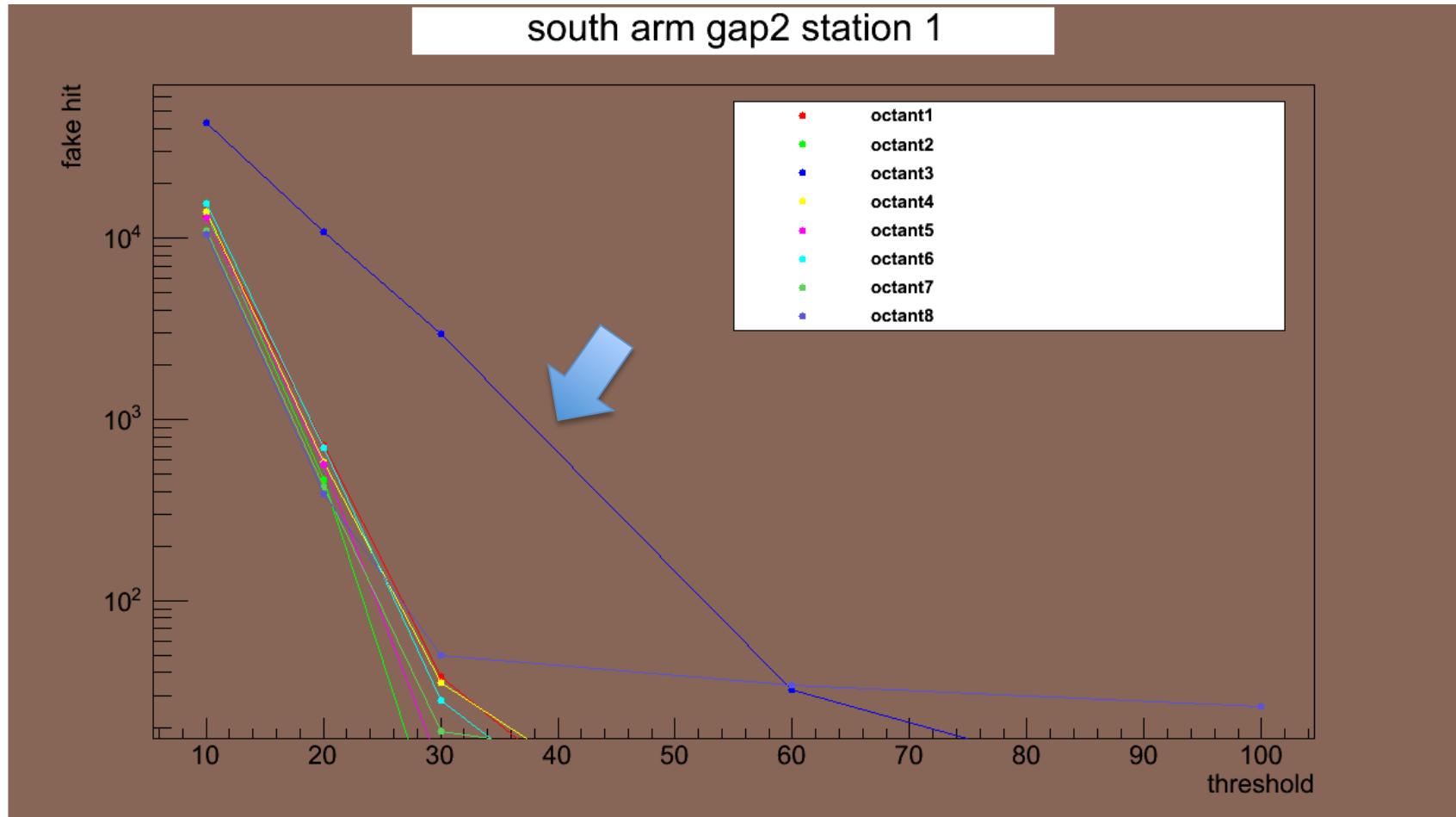
Cathode Cable in mis-contact : South Station-1 Oct-5, Gap-2

Hit Map (South Gap2 only)

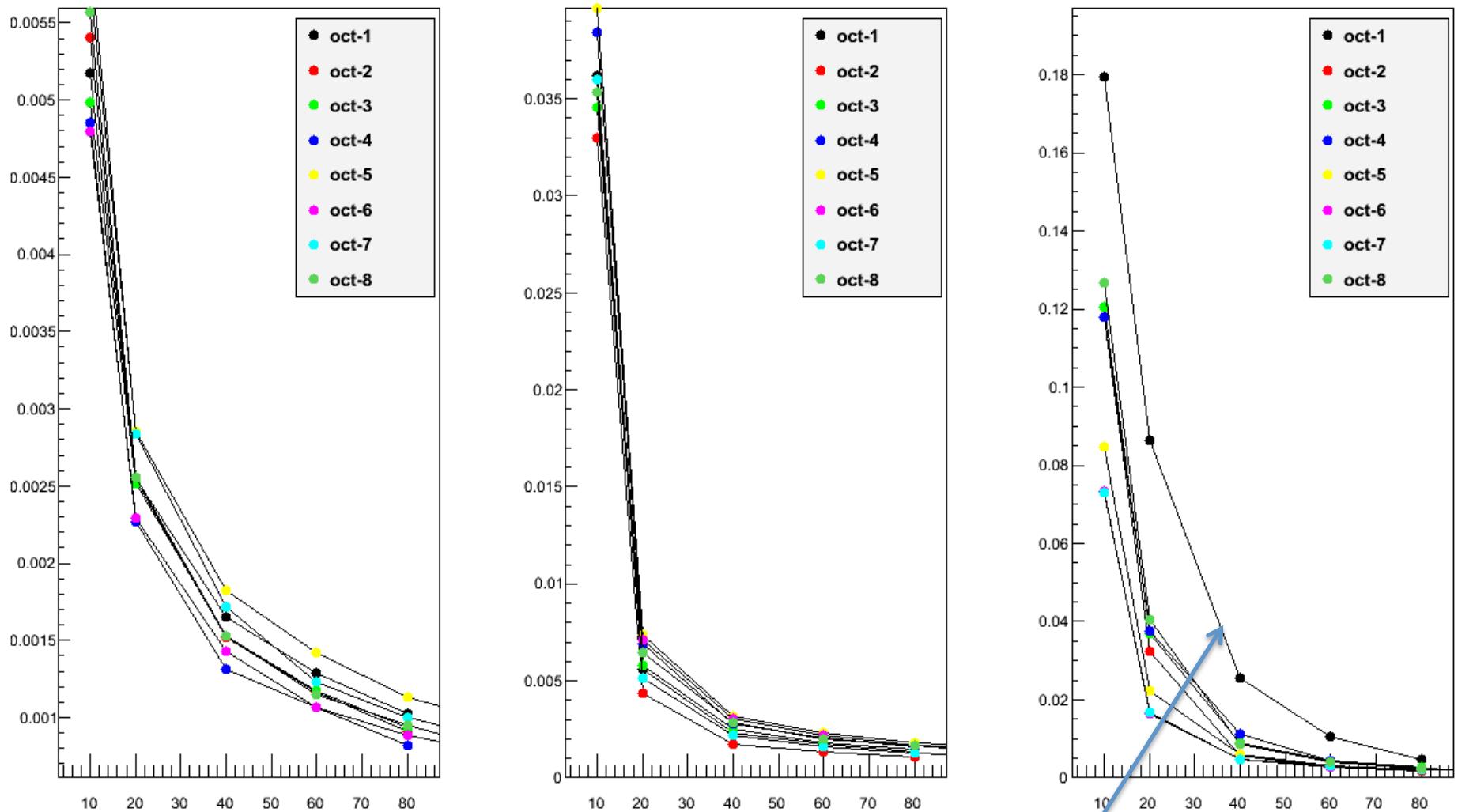
LL1 width:1 threshold:40mV Logic:Gap2 only



High Noise Rate in South St-1 Oct-3 Gap-2



North Station-3 Octant-1

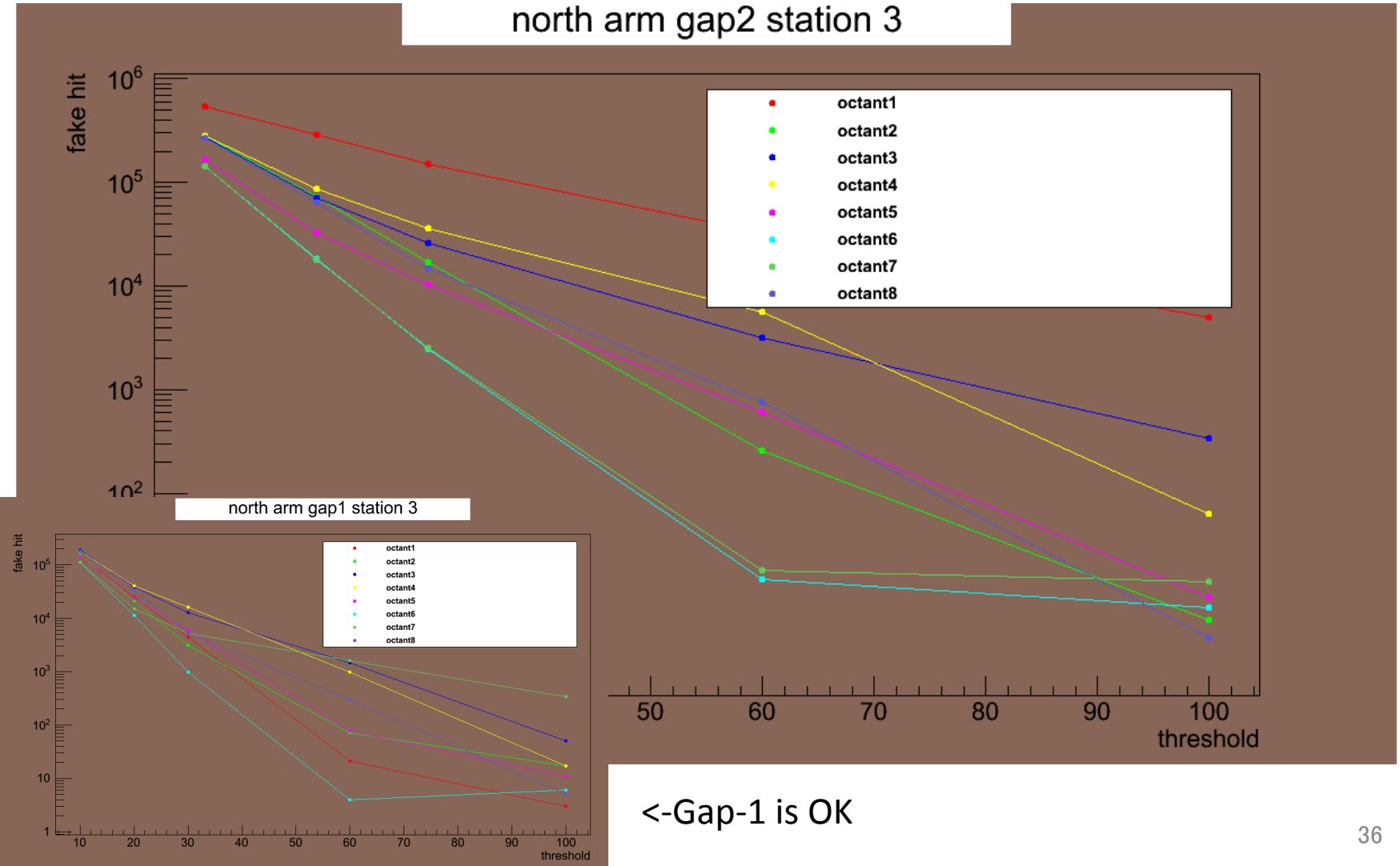


See next page for gap decomposition

North Station-3 Octant-1 stands out ³⁵

North Station-3 Octant-1 Gap-2

north arm gap2 station 3



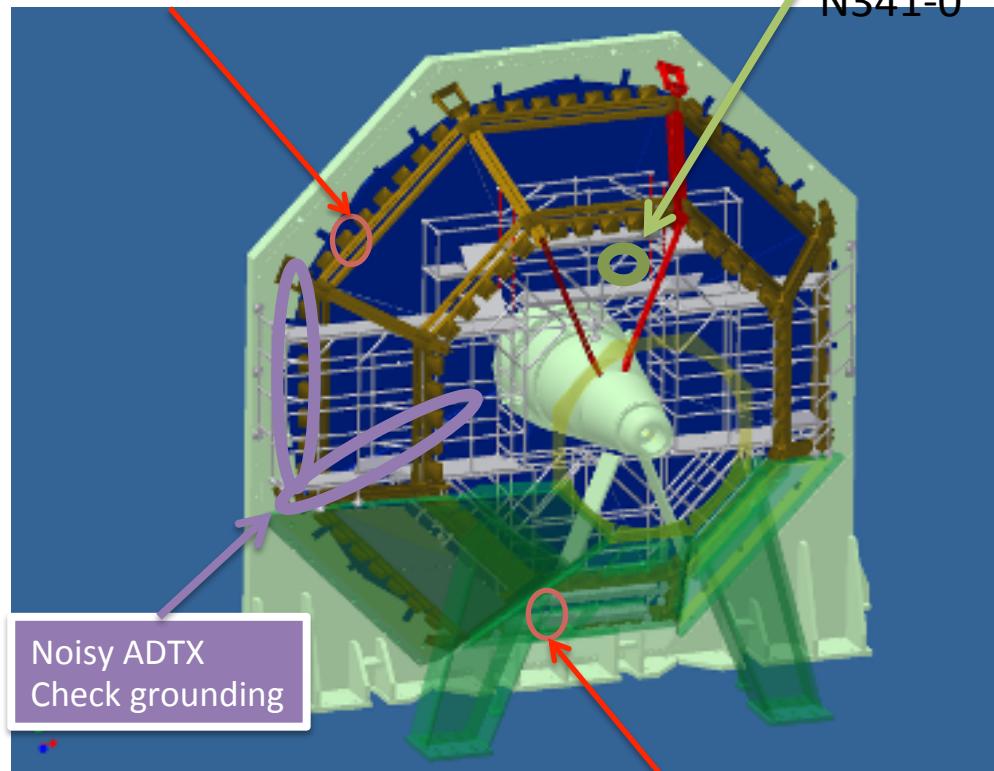
Need to change
FEE boards

North Arm

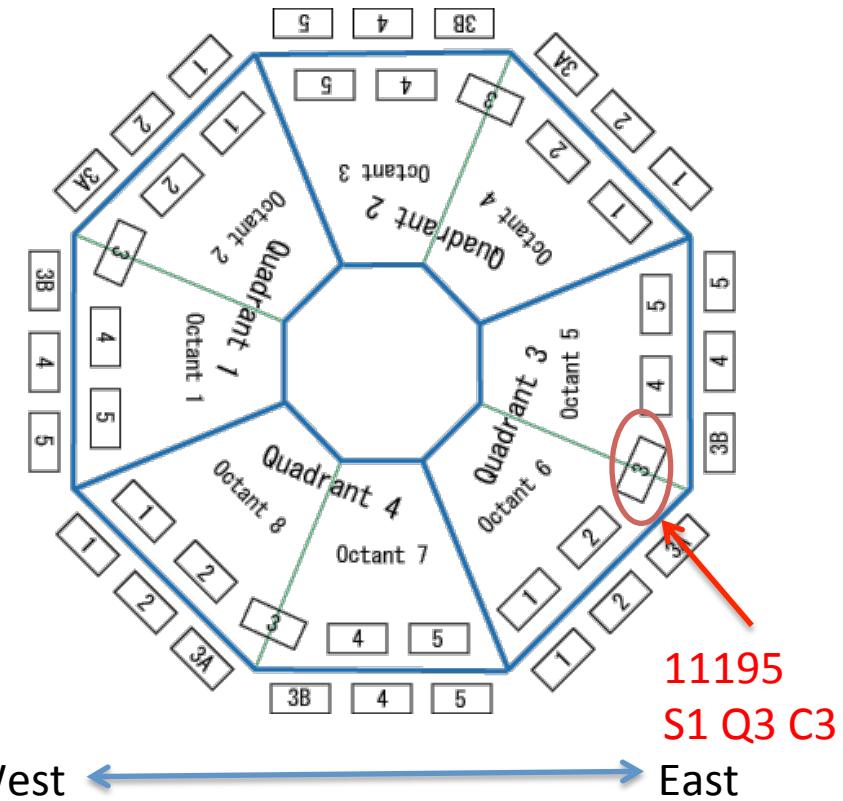
11300
S3 O2 C6

Station-2,3

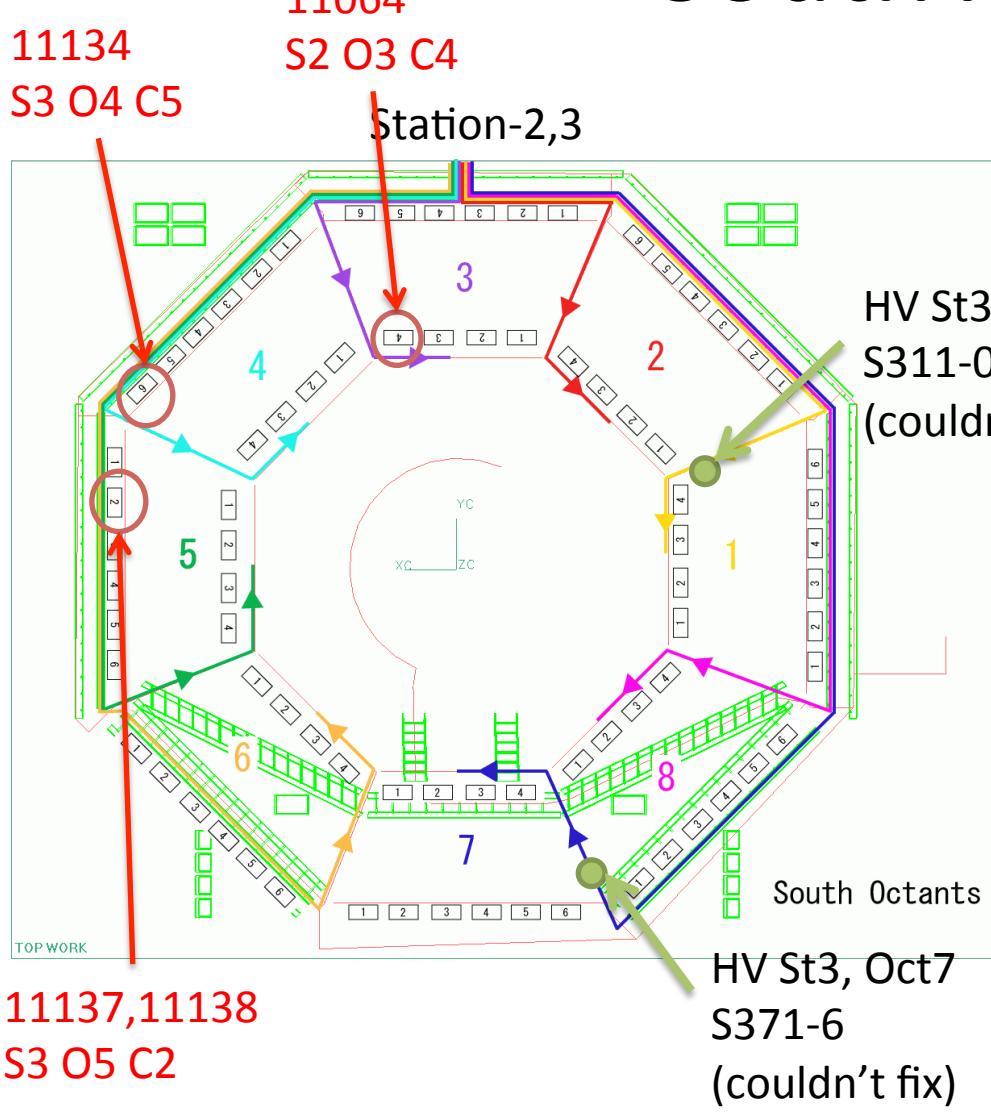
HV St-3 Oct4
N341-0



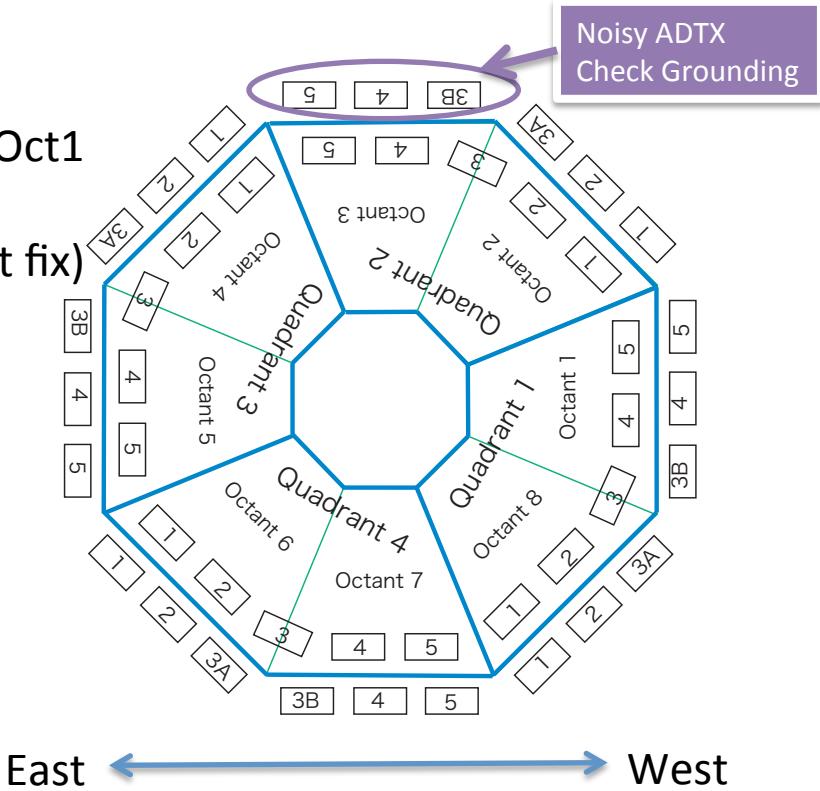
Station-1



South Arm

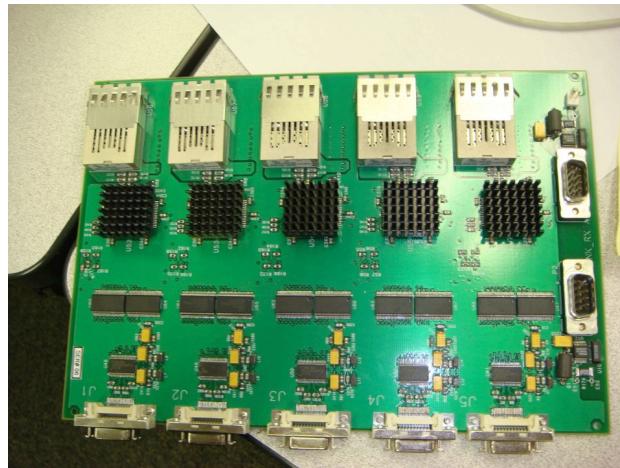
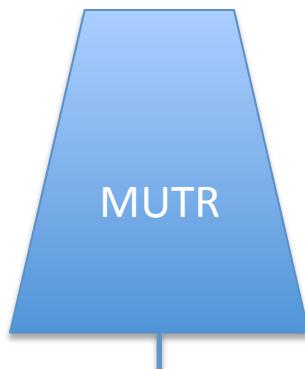


South Station-1 Chassis



MuTr RX Card Debugging (1)

- RX card transmits electrical signal to optical.
- We have only 3 spare good boards and 7 spare boards to be debugged.
- To be tested at John Haggerty's test bench.



MuTr RX Card Debugging (2)

仁科加速器研究センター 共用促進・産業連携部 公… www.phenix.bnl.gov/… 2013 Summer Science… Forward sPHENIX Wor… RX/TX board test & r… [edit]

- After inspection, we can test the board at test stand.
- The test stand is in John's test booth at 1008 trailer. Ask and discuss with John H. to use the test stand.
- In the test stand, we take data and check the status of the board.

Test setup at test stand

[edit]

- Prepare test stand and put the RX board to the slot of the crate. Connect powers.
 - There are two kinds of power of 3.3 V and 5 V. Need to be very careful not to mis-connect the power slot. It would blow the circuit if the power cables are connected wrong. See the [overview](#) which shows RX board and power connections.
 - Optical fiber of RX board should go to TX labeled slot. See the [optical cable](#) for the picture.
 - Turn on the power of the crate. Before turn on the power, make sure the test jig / DC fan switches are up as the [picture \(switches\)](#).
 - Connect to test stand through the VNC,
 - 1. Open the tunnel through 'ssh -l user_id -L 5911:phnxdaq.phenix.bnl.gov:5902 user_id@rssh.rhic.bnl.gov'.
 - 2. Use VNC viewer and connect to the test machine. When connected, it looks like [this \(Test window\)](#).

Test procedure

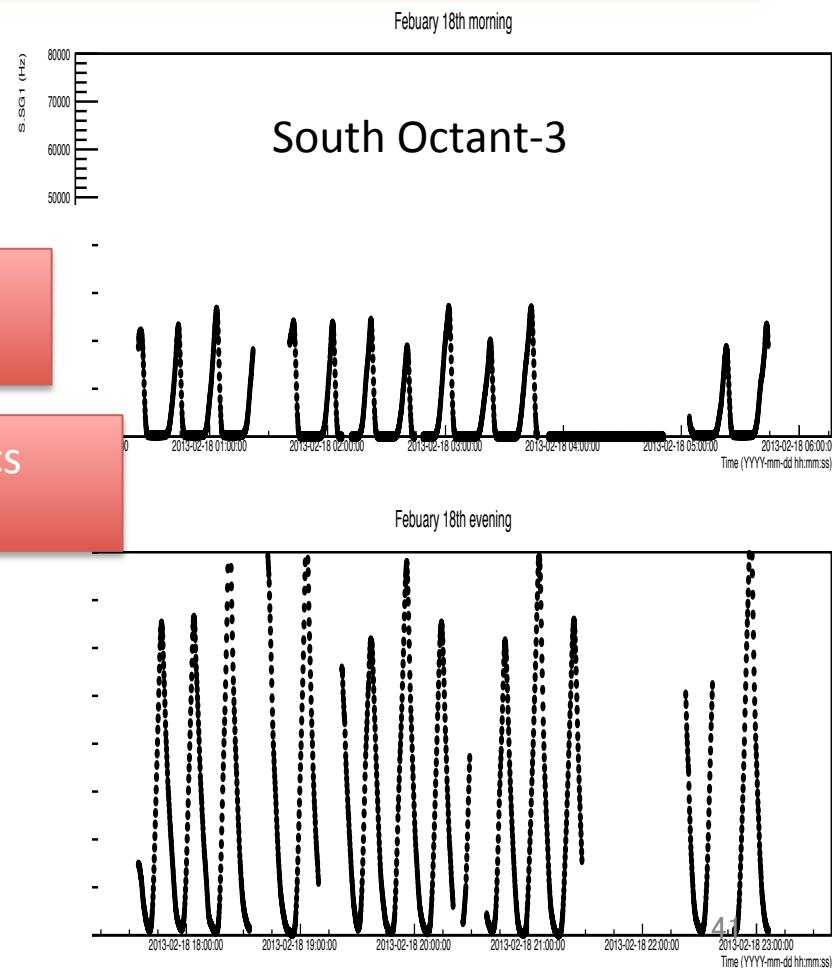
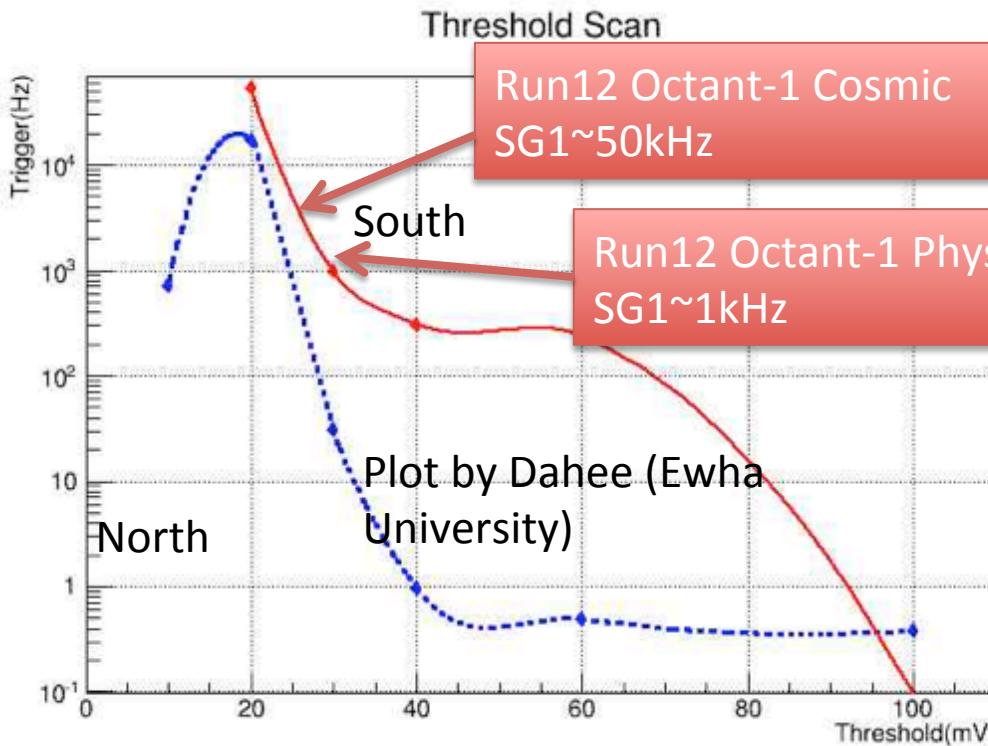
[edit]

- 1. When connect and test each connector, wait for about 30 seconds until the test circuit is ready. When the marked [red light](#) is blinking, it is ready to start.
- 2. Type `init_mutrtb.pl` under `/home/phnxrc/haggerty/aisrvr/mutrtb`. [Test window](#) is showing an example for that.
- 3. Start standalone RC by typing `'unrc.sh -standalone -p EMC.TB -o kl &` under `/export/software/oncs/online_configuration/rc/hw`. [Test window](#) is showing an example for that.
 - On the RC, do 'Download', 'Open' (To write the data to disk), and 'Start'
- 4. Check the data taken.
 - Can use `'ddump -n 0 -f rc-0364170-EMC.TB-0.prdf | more'` to look through the prdf file and check stuck bit. Data are stored at `/scratch1/buffer/junkdata`.
 - Can use online monitoring to check parity error, etc.
 - To run the monitoring, at the `/home/phnxvtx/kblee/daqmon`, 1. source `setup_onlmon.csh`, 2. run the macro, `run_daq.C("/scratch1/buffer/junkdata/rc-0365101-EMC.TB-0.prdf")` and 3. `prun()`
 - At second terminal, do 1. `.L run_daq.C`, 2. `daqDrawInit()`, 3. `daqDraw()`, 4. `daqDraw("DAQ%MUSTRNORTH")`
 - You can see examples of [good one](#) and [bad one](#).
- 5. move to next connector to check and repeat 1 ~ 4.

Debugging MRG FPGA

FPGA: verilog HDL

	Symptom
South Octant-1	Constant Rates (Threshold dependent)
South Octant-3	Excursion w/ time constant of ~20minutes
Above two octants are running with older version of MRG FPGA in Run13. Both are observable with cosmic circumstances	



Shutdown Summary

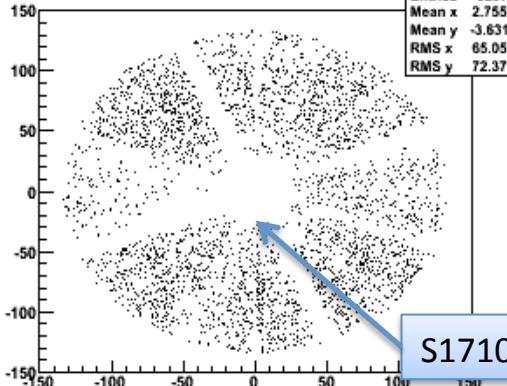
- Itaru/Minjung/Kiyoshi/Takeru + LANL crews work on maintenance
- Address on High noise ADTX
- Fix loose cathode cable connection in South St-1
- Debug MRG FPGA Code
- Replace MuTr-FEE frequently cause errors
- MuTr HV server upgrade (Martin)
- Repair spare RX cards
- Inspect dry air covers (fragile tube connection).

South

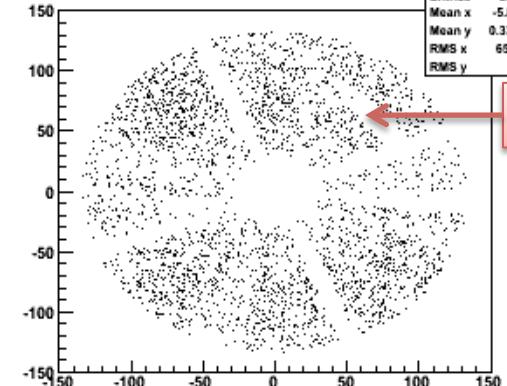
Run#

324366

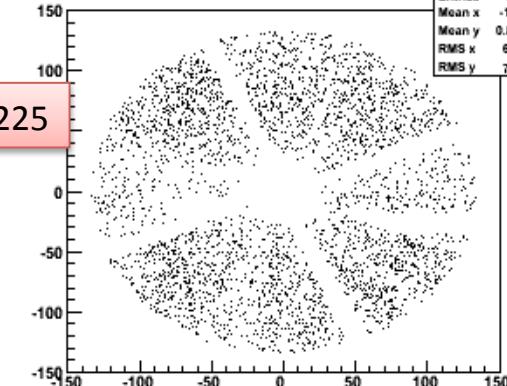
Mutr Hit Coordinate - Arm[0] Sta[0] Gap[0]



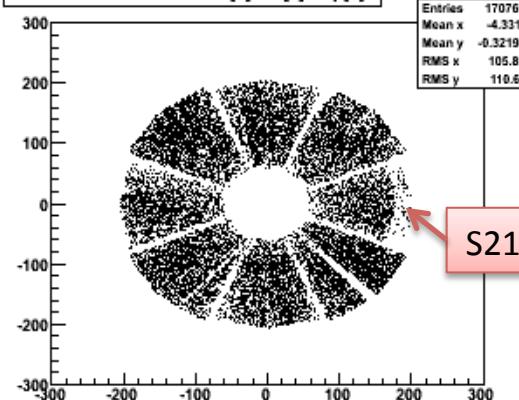
Mutr Hit Coordinate - Arm[0] Sta[0] Gap[1]



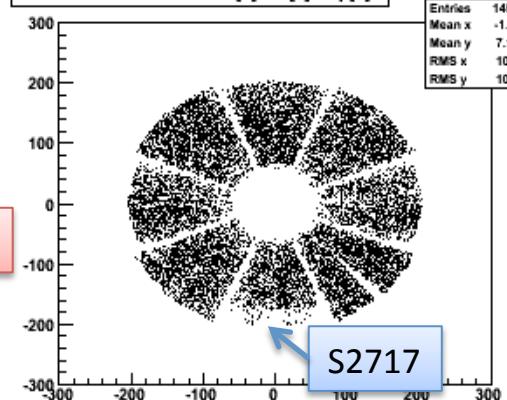
Mutr Hit Coordinate - Arm[0] Sta[0] Gap[2]



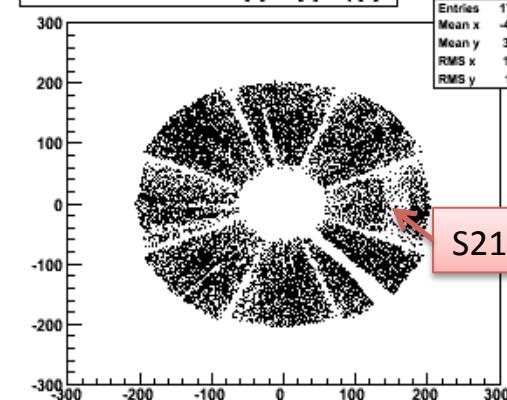
Mutr Hit Coordinate - Arm[0] Sta[1] Gap[0]



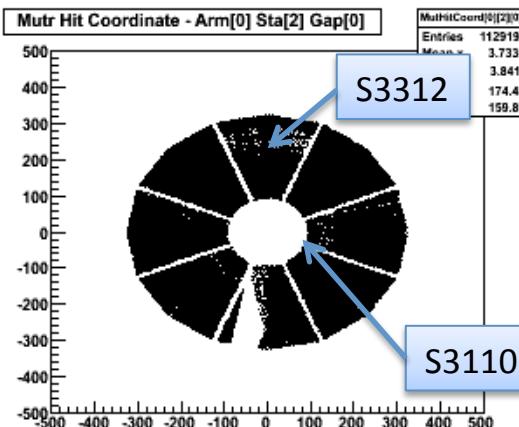
Mutr Hit Coordinate - Arm[0] Sta[1] Gap[1]



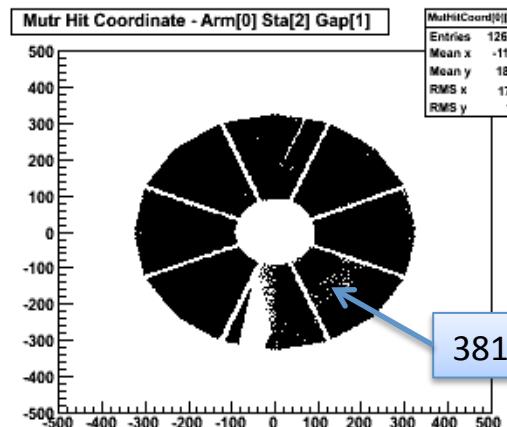
Mutr Hit Coordinate - Arm[0] Sta[1] Gap[2]



Mutr Hit Coordinate - Arm[0] Sta[2] Gap[0]



Mutr Hit Coordinate - Arm[0] Sta[2] Gap[1]



Disabled List

S1710✓

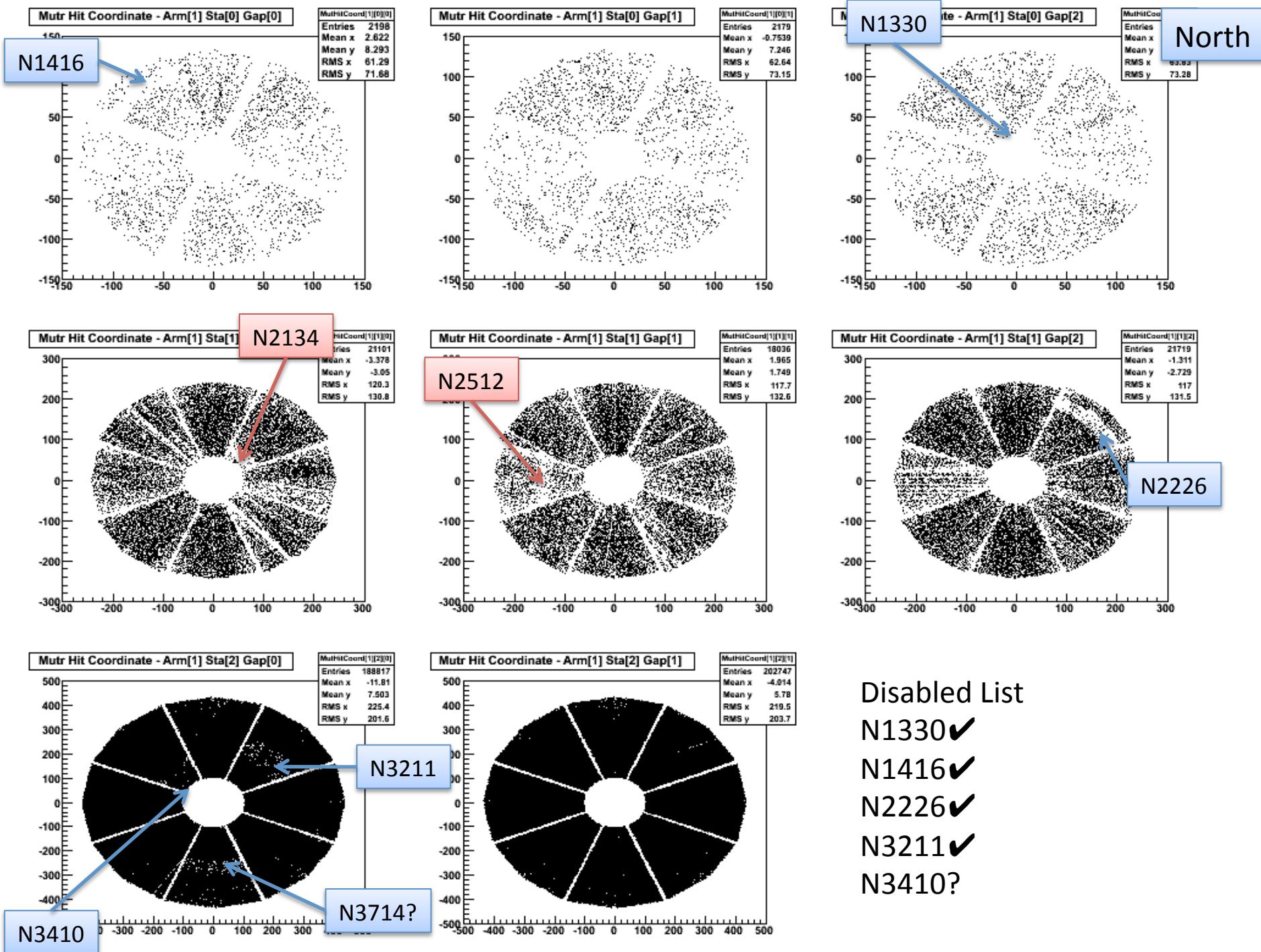
S2717✓

S3110✓

S3312✓

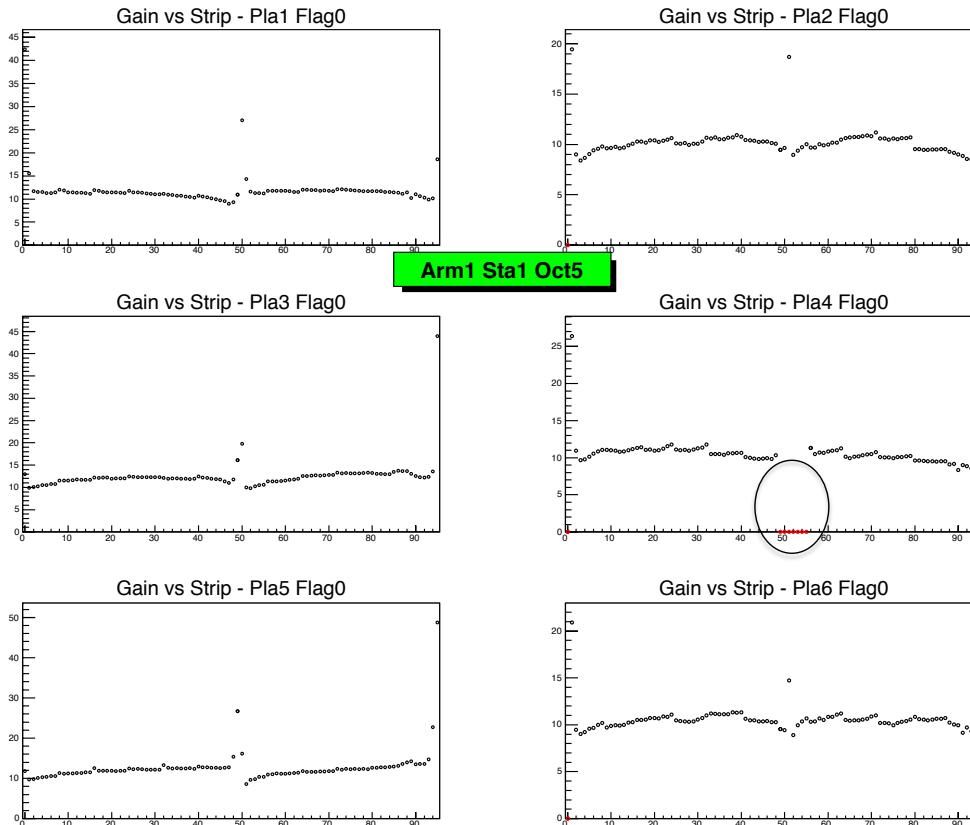
S3815✓

- listed in disabled list
- Broken Anode/Card



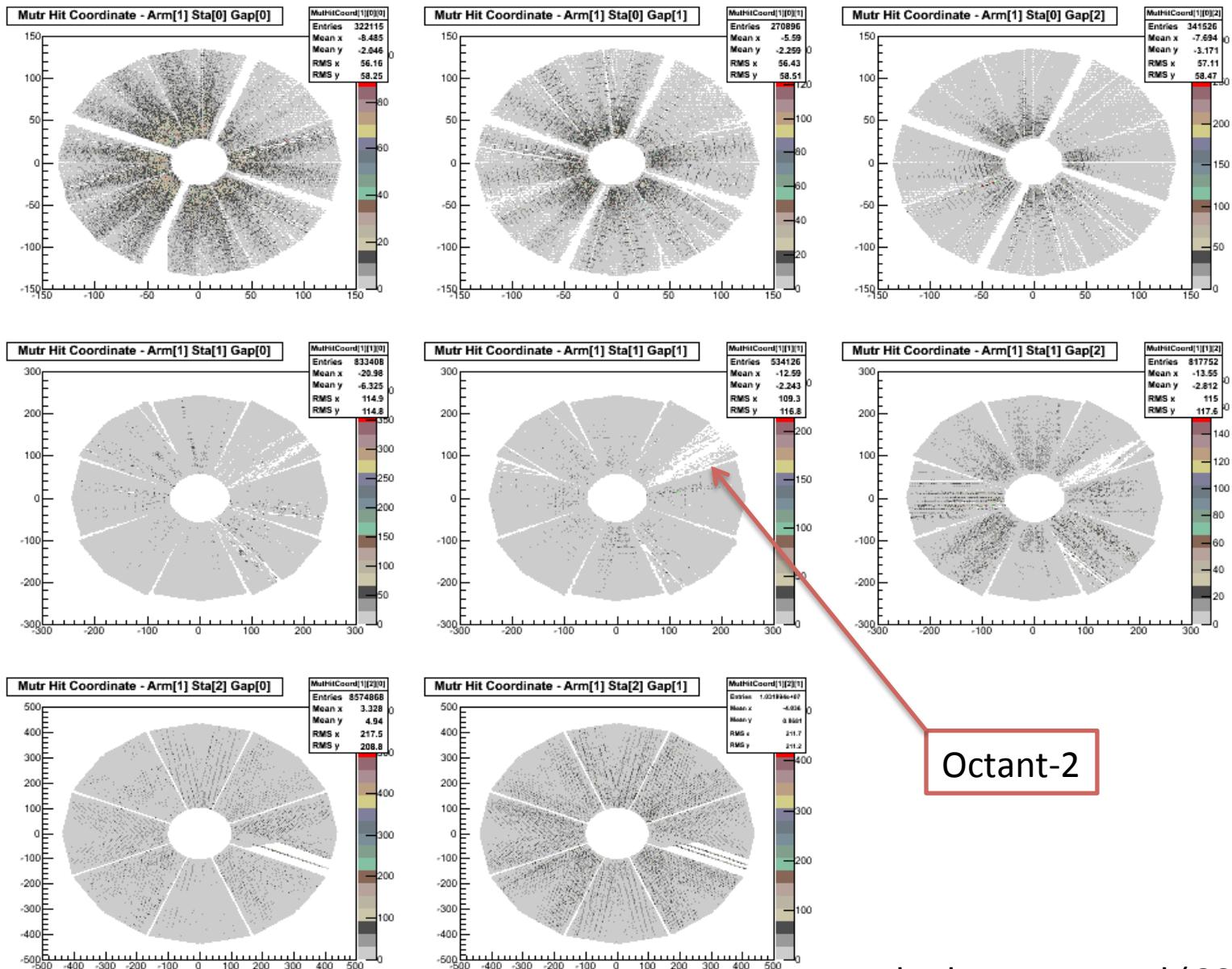
Acceptance

MuTr gain - South station1 oct5 (count from 1, recent calibration)



Possible loose cathode connection when SMM moved to run position before Run13

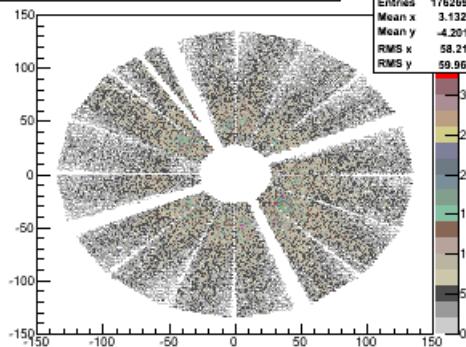
MuTr Radio Graph (North)



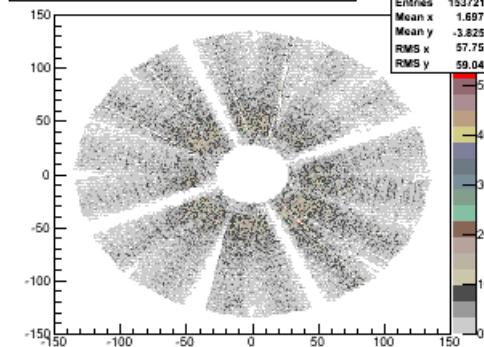
Plot by Laura Patel (GSU)

Radio Graph MuTr South

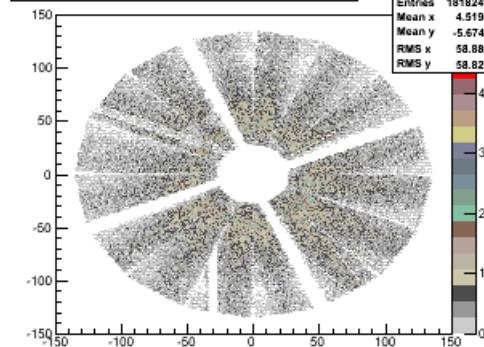
Mutr Hit Coordinate - Arm[0] Sta[0] Gap[0]



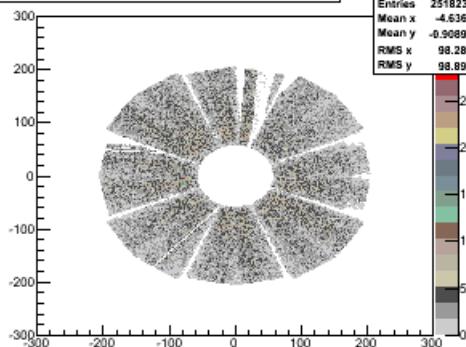
Mutr Hit Coordinate - Arm[0] Sta[0] Gap[1]



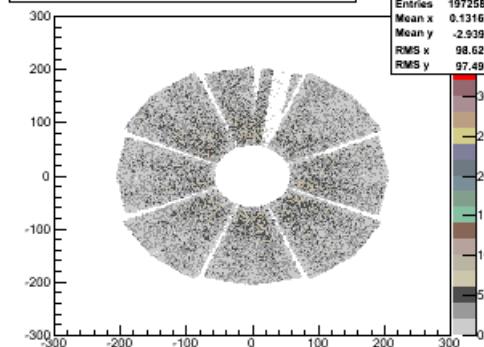
Mutr Hit Coordinate - Arm[0] Sta[0] Gap[2]



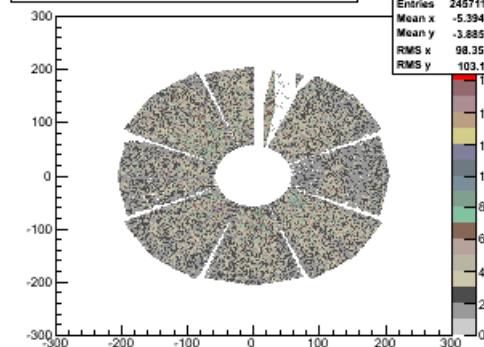
Mutr Hit Coordinate - Arm[0] Sta[1] Gap[0]



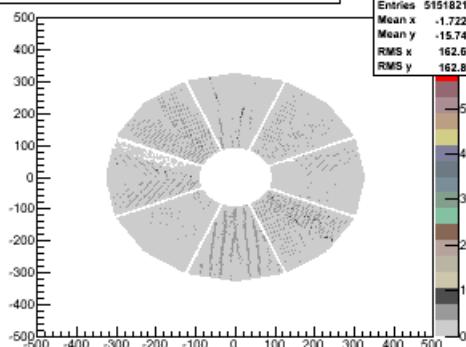
Mutr Hit Coordinate - Arm[0] Sta[1] Gap[1]



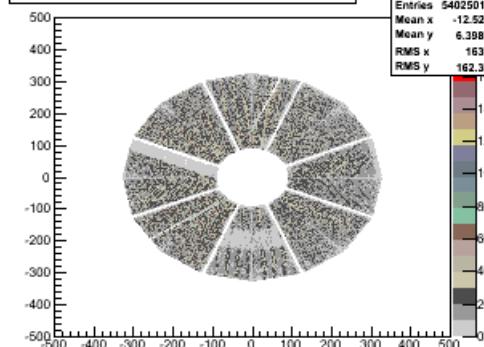
Mutr Hit Coordinate - Arm[0] Sta[1] Gap[2]



Mutr Hit Coordinate - Arm[0] Sta[2] Gap[0]



Mutr Hit Coordinate - Arm[0] Sta[2] Gap[1]



Run#388266

Plot by Laura Patel (GSU)